

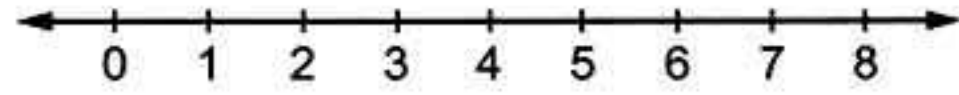


## Lesson Three

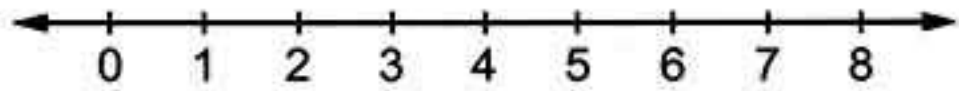
From the school book

**Exercise 3** Addition operation – Subtraction operation on  $\mathbb{N}$ 
**1** Use the number line to find each of the following :

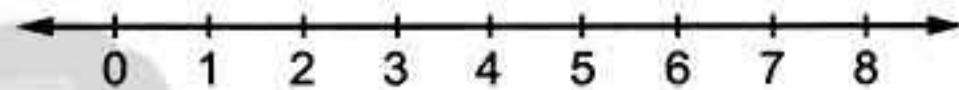
(a)  $4 + 2 = \dots\dots\dots$



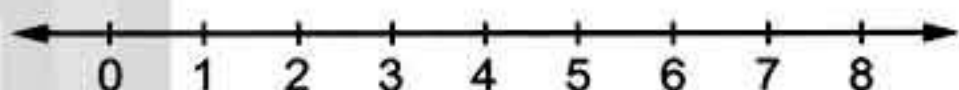
(b)  $7 - 5 = \dots\dots\dots$



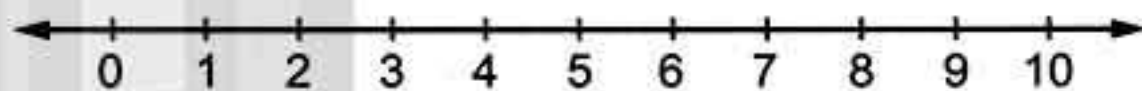
(c)  $1 + 4 = \dots\dots\dots$



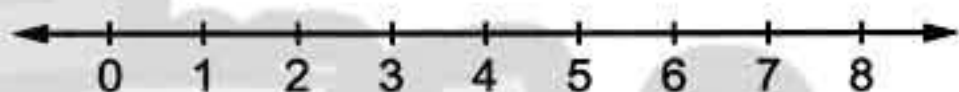
(d)  $6 - 6 = \dots\dots\dots$



(e)  $2 + 5 + 1 = \dots\dots\dots$



(f)  $3 + 5 - 1 = \dots\dots\dots$


**2** Complete to get a true statement :

(a)  $213 + 57 = 57 + \dots\dots\dots$  (..... property)

(b)  $149 + 673 = 673 + \dots\dots\dots$  (..... property)

(c)  $17 + \dots\dots\dots = \dots\dots\dots + 17 = 17$  (..... property)

(d)  $28 + (72 + 59) = (28 + \dots\dots\dots) + 59$  (..... property)

(e)  $(61 + 715) + 3\,547 = \dots\dots\dots + (715 + 3\,547)$  (..... property)

(f)  $a + \dots\dots\dots = b + \dots\dots\dots$  (..... property)

(g)  $(\dots\dots\dots + a) + b = c + (\dots\dots\dots + b)$  (..... property)

**3** Find the sum using commutative and associative properties in  $\mathbb{N}$  state the property used :

(a)  $28 + 15 + 72$

(b)  $257 + 71 + 49$

(c)  $753 + 972 + 247$

(d)  $76 + 15 + 85 + 24$

(e)  $672 + 665 + 335 + 328$

(f)  $973 + 299 + 227 + 901$

(g)  $38 + 46 + 62 + 54 + 79$

(h)  $53 + 62 + 75 + 47 + 25 + 38$

## Unit One

4 Complete using  $\in$  or  $\notin$  :

- (a)  $(3 + 7) \dots \mathbb{N}$  (b)  $(45 - 35) \dots \mathbb{N}$   
 (c)  $(8 - 10) \dots \mathbb{N}$  (d)  $(80 - 80) \dots \mathbb{N}$   
 (e)  $(0 - 0) \dots \mathbb{N}$  (f)  $(28727 - 9543) \dots \mathbb{N}$   
 (g)  $(16 - 9) - 7 \dots \mathbb{N}$  (h)  $3 - (9 - 2) \dots \mathbb{N}$

5 Complete with = or  $\neq$  :

- (a)  $35 - 28 \dots 28 - 35$   
 (b)  $(17 + 90) + 125 \dots 17 + (90 + 125)$   
 (c)  $0 - 25 \dots 25 - 0$   
 (d)  $208 + 3\,541 \dots 3\,541 + 208$   
 (e)  $(215 - 147) - 69 \dots 215 - (147 - 69)$

6 Complete the following expressions by using  $>$ ,  $<$  or  $=$  :

- (a)  $714 + 359 \dots 359 + 714$   
 (b)  $1\,248 + 890 \dots 1\,247 + 890$   
 (c)  $17\,248 + 0 \dots 17\,248$   
 (d)  $(74 + 705) + 19 \dots 74 + (705 + 19)$   
 (e)  $(802 + 65) + 19 \dots 19 + (65 + 801)$   
 (f)  $(93 + 87) - (87 + 39) \dots 0$

7 Mark ( $\checkmark$ ) for the correct statements and ( $\times$ ) for the incorrect ones :

- (a) The set of natural numbers is closed under the subtraction. ( )  
 (b) The addition operation of natural numbers is associative. ( )  
 (c) Zero is the neutral element for addition. ( )  
 (d) The addition operation of natural numbers is commutative. ( )  
 (e) The subtraction operation of natural numbers is associative. ( )  
 (f) The set of natural numbers is closed under the addition. ( )  
 (g) The subtraction operation of natural numbers is commutative. ( )  
 (h) The difference between any two natural numbers  $\in \mathbb{N}$ . ( )



## Lesson Three

**8** Complete using (odd or even) :

- (a) The sum of two odd numbers = ..... number.  
 (b) The sum of two even numbers = ..... number.  
 (c) An odd number + an even number = ..... number.  
 (d) If  $x$  is an odd number , then  $(x + 2)$  is ..... number.  
 (e) If  $x$  is an even number , then  $(x + 2)$  is ..... number.  
 (f) If  $x$  is an even number , then  $(x + 1)$  is ..... number.  
 (g) If  $x$  is an odd number , then  $(x - 1)$  is ..... number.



## Challenge

**9** Without doing operations, complete the following expressions with  $>$  or  $<$  or  $=$  :

- (a)  $27 + 15$  .....  $27 - 15$   
 (b)  $5\ 874 - 3\ 501$  .....  $5\ 874 - 3\ 502$   
 (c)  $867 - 231$  .....  $767 - 131$   
 (d)  $503 - 0$  .....  $313 - 10$   
 (e)  $(915 - 624) + 53$  .....  $915 - (624 + 53)$   
 (f)  $(384 - 157) - 64$  .....  $384 - (157 - 64)$

**10** Observe the following operations :

$$\begin{array}{r} 2\ 7\ 5 \\ +\ 3\ 1\ 9 \\ \hline 5\ 9\ 4 \end{array}$$

$$\begin{array}{r} 6\ 1\ 4 \\ +\ \ \ 2\ 8 \\ \hline 6\ 4\ 2 \end{array}$$

$$\begin{array}{r} 3\ 7\ 1\ 6 \\ +\ \ \ 5\ 9\ 4 \\ \hline 4\ 3\ 1\ 0 \end{array}$$

$$642 + 355 = 997$$

$$594 + 642 = 1\ 236$$

Then , find the following results without making operations :

- (a)  $594 + 3\ 716 =$  .....      (b)  $355 +$  .....  $= 997$   
 (c)  $319 + 275 =$  .....      (d)  $275 + 319 + 3\ 716 =$  .....  
 (e)  $355 + 28 + 614 =$  .....      (f)  $28 + 319 + 275 + 614 =$  .....



## Exercise 4 Multiplication operation - Division operation on $\mathbb{N}$

1 Use the commutative and associative properties to simplify finding the result of each of the following :

(a)  $2 \times 347 \times 5$

(b)  $4 \times 128 \times 25$

(c)  $8 \times 49 \times 125$

(d)  $20 \times 16 \times 5$

(e)  $16 \times 75 \times 125$

(f)  $2 \times 25 \times 75 \times 4$

(g)  $4 \times 5 \times 25 \times 6$

(h)  $125 \times 25 \times 8 \times 4$

2 Use the distributive property to simplify finding the result of each of the following :

(a)  $35 \times 64 + 35 \times 36$

(b)  $37 \times 73 + 63 \times 73$

(c)  $137 \times 43 - 37 \times 43$

(d)  $59 \times 67 - 59 \times 57$

(e)  $16 \times 999 + 16$

(f)  $37 \times 101 - 37$

3 Use the distributive property to find the value of each of the following :

(a)  $52 \times 101$

(b)  $915 \times 1001$

(c)  $45 \times 99$

(d)  $572 \times 99$

(e)  $3 \times 23$

(f)  $502 \times 50$

(g)  $35 \times 1005$

(h)  $25 \times 427$

(i)  $15 \times 284$

4 Complete with  $\in$  or  $\notin$  :

(a)  $(4 \div 2) \dots \mathbb{N}$

(b)  $\frac{0}{7} \dots \mathbb{N}$

(c)  $(4 \times 2) \dots \mathbb{N}$

(d)  $(3 \div 4) \dots \mathbb{N}$

(e)  $(18 \div 4) \dots \mathbb{N}$

(f)  $(12 \div 3) \dots \mathbb{N}$

(g)  $\frac{3}{2-2} \dots \mathbb{N}$

(h)  $(3 + 7) \dots \mathbb{N}$

## Unit One

(i)  $\square (8 - 8) \dots\dots \mathbb{N}$

(j)  $\square (0 \times 9) \dots\dots \mathbb{N}$

(k)  $(512 + 247) \dots\dots \mathbb{N}$

(l)  $(18 - 25) \dots\dots \mathbb{N}$

(m)  $(7 \div 7) \dots\dots \mathbb{N}$

(n)  $(25 \div 1) \dots\dots \mathbb{N}$

(o)  $[(6 \times 3) \div 9] \dots\dots \mathbb{N}$

(p)  $[(5 \times 6) \div 12] \dots\dots \mathbb{N}$

(q)  $[(6 \div 3) \times 5] \dots\dots \mathbb{N}$

(r)  $[(2 \div 4) \times 11] \dots\dots \mathbb{N}$

(s)  $[(7 + 13) \div 0] \dots\dots \mathbb{N}$

(t)  $[(0 \div (41 - 22))] \dots\dots \mathbb{N}$

(u)  $\square (7 \times 3 - 3 \times 7) \dots\dots \mathbb{N}$

(v)  $\square (7 \times 2 - 7 \times 5) \dots\dots \mathbb{N}$

**5** Choose the correct answer from those given :

(a) If  $a \in \mathbb{N}$ ,  $b \in \mathbb{N}$  and  $c \in \mathbb{N}$ , then  $(a \times b) \times c = a \times (b \times c)$ , that is called  $\dots\dots$  property.

(closure *or* associative *or* commutative *or* distributive)

(b)  $40 \times 98 = 40 \times 100 - 40 \times \dots\dots$

(1 *or* 2 *or* 40 *or* 98)

(c)  $56 \times (100 - \dots\dots) = 56 \times 95$

(95 *or* 90 *or* 5 *or* 50)

(d)  $27 \times 19 + 73 \times 19 = \dots\dots \times 19$

(10 *or* 100 *or* 27 *or* 73)

(e)  $177 \times 13 - \dots\dots \times 13 = 164 \times 13$

(13 *or* 341 *or* 177 *or* 164)

(f)  $\frac{0}{5} = \dots\dots$

(0 *or* 1 *or* 5 *or* is not defined)

(g)  $\frac{7}{0} \dots\dots$

(0 *or* 1 *or* 7 *or* is not defined)

(h)  $(8 + 6) \div 2 = \dots\dots$

(8 *or* 7 *or* 6 *or* 2)

(i)  $75 \div (5 \times 3) = \dots\dots$

(5 *or* 3 *or* 15 *or* 72)

(j)  $(12 \div 2) \times \dots\dots = 12$

(2 *or* 4 *or* 6 *or* 12)

(k)  $\frac{14 - 14}{7} = \dots\dots$

(14 *or* 0 *or* 2 *or* is not defined)

(l)  $\frac{20 - 20}{16 - 4 \times 3} = \dots\dots$

(0 *or* 1 *or* 5 *or* is not defined)

(m)  $\frac{7 - 3}{7 - 5} = \dots\dots$

(0 *or* 2 *or* 3 *or* is not defined)



## Lesson Four

6 Mark (✓) for the correct statements and (✗) for the incorrect ones :

- (a) The set of natural numbers is closed under the multiplication. ( )
- (b) The multiplication operation of natural numbers is commutative. ( )
- (c) Zero is the neutral element for multiplication. ( )
- (d) The multiplication operation of natural numbers is associative. ( )
- (e) The set of natural numbers is closed under the division. ( )
- (f) We can divide any natural number by zero. ( )
- (g) The division operation of natural numbers is associative. ( )
- (h)  $(28 \div 6) \in \mathbb{N}$  ( )
- (i)  $12 \div 6 = 6 \div 12$  ( )
- (j)  $40 \div (8 + 2) = (40 \div 8) + (40 \div 2)$  ( )
- (k)  $(36 \div 6) \div 3 = 36 \div (6 \div 3)$  ( )
- (l)  $32 \times (14 \times 58) = 32 \times 14 \times 32 \times 58$  ( )
- (m)  $135 \times 64 = (135 \times 60) + (135 \times 4)$  ( )
- (n)  $8 \times 54 = (8 \times 5) + (8 \times 4)$  ( )
- (o)  $12 \times (35 + 14) = 12 \times 35 + 14$  ( )
- (p)  $(81 + 112) \times 117 = 117 \times (112 + 81)$  ( )
- (q)  $(120 + 80) \times 4 = 120 \times 4 + 80 + 4$  ( )
- (r)  $4 \times (8 - 5) = (4 \times 8) - (4 \times 5)$  ( )
- (s)  $8 \times (7 + 2) = (8 \times 7) + 2$  ( )
- (t)  $7 \times 8 = (4 + 3) \times (4 \times 4)$  ( )

7 Complete :

- (a) The additive neutral element in  $\mathbb{N}$  is ..... , the multiplicative neutral element in  $\mathbb{N}$  is .....
- (b)  $a \times 1 = 1 \times a = a$  (..... property)

## Unit One

- (c)  $9 \times 13 = 13 \times x$ , then  $x = \dots\dots\dots$
- (d) 99 added to the neutral element of multiplication =  $\dots\dots\dots$
- (e)  $(12 \times 4) \times \dots\dots\dots = 12 \times (4 \times 7)$
- (f)  $(83 \times 514) \times 96 = \dots\dots\dots \times (514 \times 96)$
- (g)  $(\dots\dots\dots \times 10) \times 5 = 20 \times (10 \times 5)$
- (h)  $\dots\dots\dots \times 75 = 75 \times 1 = \dots\dots\dots$
- (i)  $\dots\dots\dots + 354 = 354$
- (j)  $4 \times 10 \times 8 = \dots\dots\dots \times 80 = \dots\dots\dots$
- (k)  $7 \times 0 = \frac{\dots\dots\dots}{9} = \dots\dots\dots$
- (l)  $(9 \times 5) \times 8 = 9 \times \dots\dots\dots = \dots\dots\dots$
- (m)  $7 \times (4 + \dots\dots\dots) = 7 \times 4 + 7 \times 5$
- (n)  $5 \times (1 + 4) = 5 \times \dots\dots\dots + 5 \times \dots\dots\dots$
- (o)  $16 \times (54 + 71) = 16 \times 54 + 16 \times \dots\dots\dots$
- (p)  $32 \times 9 + 32 \times 6 = \dots\dots\dots \times (\dots\dots\dots + \dots\dots\dots)$
- (q)  $35 \times 185 + 35 \times \dots\dots\dots = 35 \times 300$
- (r)  $2358 \times 17 = 2358 \times (7 + \dots\dots\dots)$
- (s) If  $834 = (x \times 100) + 34$ , then  $x = \dots\dots\dots$
- (t) If  $3 \times 98 = (x \times 8) + (x \times 90)$ , then  $x = \dots\dots\dots$
- (u) If  $75 = 5 + x \times 10$ , then  $x = \dots\dots\dots$
- (v)  $\dots\dots\dots \times 1 = \dots\dots\dots \times \dots\dots\dots = 73$
- (w) An odd number  $\times$  an even number =  $\dots\dots\dots$  number

8 Put [ > or < or = ] :

(a)  $12 \times 54 \dots\dots\dots 54 \times 12$

(b)  $15 \times 392 \dots\dots\dots 14 \times 392$



## Lesson Four

- (c)  $907 \times 0 \dots\dots\dots 907$                       (d)  $1 \times 6217 \dots\dots\dots 6217$   
 (e)  $1 \times 8215 \dots\dots\dots 8210$                       (f)  $85 \times 210 \dots\dots\dots 86 \times 211$   
 (g)  $(58 \times 13) \times 29 \dots\dots\dots 58 \times (14 \times 29)$   
 (h)  $(74 \times 705) \times 19 \dots\dots\dots 74 \times (705 \times 19)$

9 Let  $a = 3$  ,  $b = 4$  and  $c = 0$  , find the value of each of the following :

- (a)  $2 \times a + 5 \times b$                       (b)  $a \times c + b \times c$   
 (c)  $(3 \times a + 5 \times b) \times c$                       (d)  $(a + b - c) \times (a + b)$   
 (e)  $(b - a) \times (b + a)$

10 Evaluate :  $(16 + 24) \div 4$  ,  $(16 \div 4) + (24 \div 4)$  what do you notice ?

11 Write the results of the given expressions in an ascending order :

$7 \times 10$  ,  $35 - 0$  ,  $178 - 178$  ,  $(2 \times 3) \times 5$

12 Name each of the following properties :

- (a) For any two natural numbers  $a$  and  $b$  , their sum  $(a + b)$  is also a natural number.  
 (b) For any two natural numbers  $a$  and  $b$  ,  $a + b = b + a$   
 (c) For any three natural numbers  $a$  ,  $b$  and  $c$  , we have  
 $a + (b + c) = (a + b) + c$   
 (d) For any natural number  $a$  , we have  $a + 0 = 0 + a = a$   
 (e) For any two natural numbers  $a$  and  $b$  , their product  $a \times b$  is also a natural number.  
 (f) For any two natural numbers  $a$  and  $b$  , we have  $a \times b = b \times a$   
 (g) For any three natural numbers  $a$  ,  $b$  and  $c$  , we have  
 $a \times (b \times c) = (a \times b) \times c$



## Unit One

- (h) For any natural number  $a$  , we have  $a \times 1 = 1 \times a = a$
- (i) For any three natural numbers  $a$  ,  $b$  , and  $c$  , we have  
 $a \times (b + c) = (a \times b) + (a \times c)$



## Challenge

13 Observe the following multiplications :

$$\begin{array}{r} 23 \\ \times 19 \\ \hline 437 \end{array}$$

$$\begin{array}{r} 19 \\ \times 54 \\ \hline 1026 \end{array}$$

$$\begin{array}{r} 23 \\ \times 41 \\ \hline 943 \end{array}$$

$$\begin{array}{r} 437 \\ \times 28 \\ \hline 12236 \end{array}$$

Find the following results without making multiplications :

- (a)  $19 \times 23 = \dots\dots\dots$
- (b)  $54 \times (10 + 9) = \dots\dots\dots$
- (c)  $23 \times (30 + 11) = \dots\dots\dots$
- (d)  $28 \times (400 + 30 + 7) = \dots\dots\dots$
- (e)  $41 \times \dots\dots\dots = 943$
- (f)  $19 \times (54 + 23) = \dots\dots\dots + \dots\dots\dots = \dots\dots\dots$
- (g)  $19 \times (23 \times 28) = \dots\dots\dots \times \dots\dots\dots = \dots\dots\dots$
- (h)  $23 \times 60 = 23 \times (\dots\dots\dots + \dots\dots\dots) = \dots\dots\dots + \dots\dots\dots = \dots\dots\dots$



## Exercise

## 5

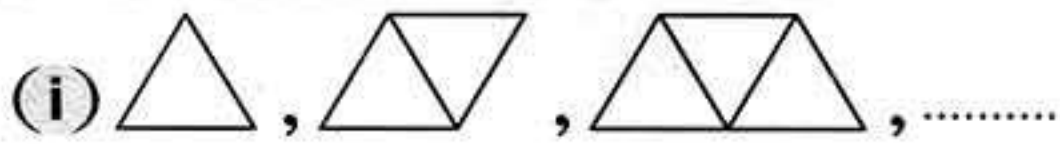
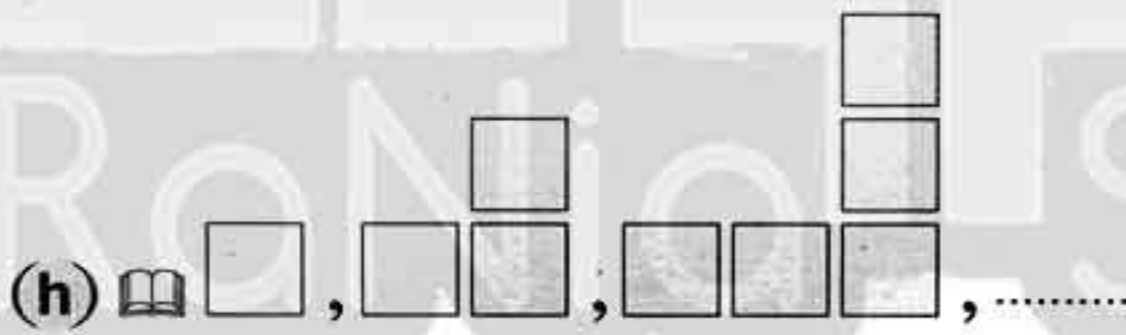
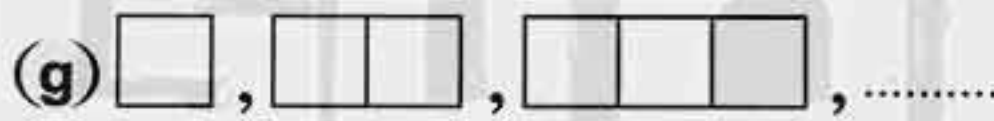
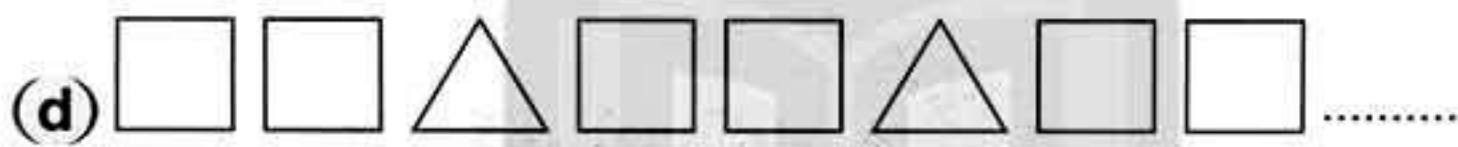
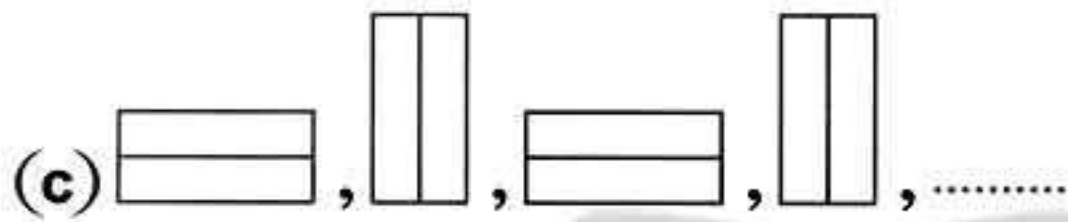
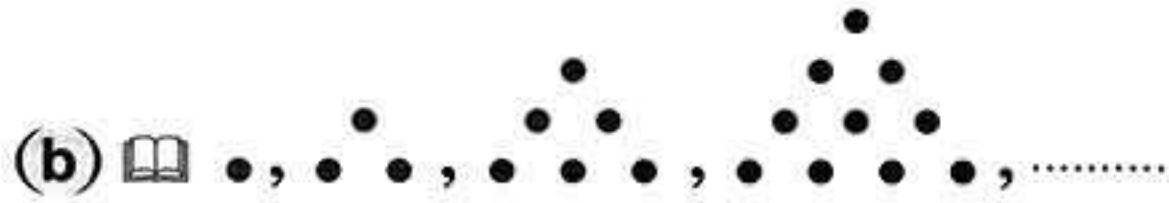
## Numerical patterns

1 Complete in the same pattern :

- (a) 2, 4, 8, 16, ..... , ..... (b) 5, 7, 9, 11, ..... , .....  
 (c) 1, 4, 7, 10, ..... , ..... (d) 2, 6, 18, 54, ..... , .....  
 (e) 2, 7, 12, 17, ..... , ..... (f) 2, 8, 32, ..... , .....  
 (g) 1, 3, 9, 27, ..... , ..... (h) 5, 15, 25, 35, ..... , .....  
 (i) 12, 10, 8, 6, ..... , ..... (j) 95, 80, 65, 50, ..... , .....  
 (k) 1, 2, 4, 7, ..... , ..... (l) 1, 4, 8, 13, ..... , .....  
 (m) 2, 5, 10, 17, 26, ..... , ..... (n) 25, 20, 16, 13, ..... , .....  
 (o) 142, 143, 145, 148, 152, .....  
 (p) 89, 79, 70, 62, 55, .....  
 (q) 18, 9, 4.5, ..... , .....  
 (r) 1, 1, 2, 3, 5, 8, ..... , .....  
 (s) 7, 77, 777, 7777, ..... , .....  
 (t)  $1 \times 1$ ,  $2 \times 2$ ,  $3 \times 3$ ,  $4 \times 4$ , ..... , .....  
 (u)  $1 \times 2$ ,  $2 \times 4$ ,  $3 \times 8$ , ..... , .....  
 (v) (2, 5), (4, 7), (6, 9), (8, .....), (10, .....), (....., 15)  
 (w) (A, Z), (B, Y), (C, X), (D, .....), (E, .....), (....., U)  
 (x)   
           4                  5                  6                  7                  8  
 (y) ..... , ..... , 8, 11, 14, ..... , .....  
 (z) ..... , ..... , 12, 24, 48, ..... , .....

## Unit One

2 Complete each of the following visual patterns :



3 Evaluate using a calculator. Write only 5 decimals without approximation.

$$\frac{2}{9} = \dots\dots\dots$$

$$\frac{1}{9} = 0.11111$$

$$\frac{3}{9} = \dots\dots\dots$$





## Lesson Five

Without using your calculator , can you evaluate :

$$\frac{4}{9} = \dots\dots\dots$$

$$\frac{5}{9} = \dots\dots\dots$$

$$\frac{6}{9} = \dots\dots\dots$$

$$\frac{7}{9} = \dots\dots\dots$$

$$\frac{8}{9} = \dots\dots\dots$$

- 4 Sherine sold a discount card that gives a discount to its owner at some fast food restaurants for L.E. 38. If the price of the card had increased L.E. 4 annually during her owning to the card for 4 years. How much did she spend to buy this card ?

- 5 Hany has 3 test rabbits in his lab. If the number of rabbits is doubled each certain period. How many rabbits will be there in 5 periods ?

- 6 Dina paid L.E. 34 for her annual membership card in a science club. Dina told her friend Hanaa that this amount is increased by L.E. 11 annually. How much will it be after 10 years ?



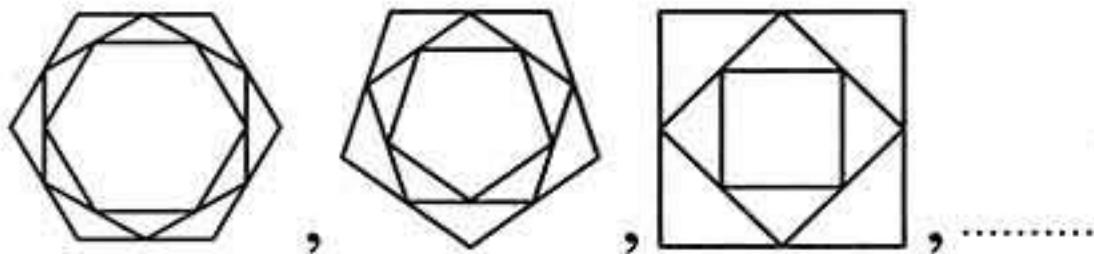
## Challenge

- 7 Write down three successive numbers in each pattern :

(a) 299 , 293 , 288 , 282 , 277 , ..... , ..... , .....

(b) 480 , 492 , 486 , 498 , 492 , 504 , ..... , ..... , .....


- 8 Discover the rule and complete by drawing the next figure :



## Test on Unit One



## 1 Choose the correct answer from the given ones :

- ①  $25 \dots\dots \mathbb{N}$  ( $\subset$  or  $\not\subset$  or  $\notin$  or  $\in$ )
- ②  $(8 \times 3) \times 5 = \dots\dots \times (3 \times 5)$  (3 or 5 or 8 or 35)
- ③ If O is the set of odd numbers , E is the set of even numbers , then  
 $O \cap E = \dots\dots$  ( $\mathbb{N}$  or O or E or  $\emptyset$ )
- ④  $c \dots\dots a$   where a , c are two natural numbers.  
 (> or = or <)
- ⑤  $\{4, \frac{1}{5}\} \dots\dots \mathbb{N}$  ( $\in$  or  $\notin$  or  $\subset$  or  $\not\subset$ )
- ⑥ If  $X = \{x : x \in \mathbb{N}, 2 \leq x \leq 3\}$  , then  $X = \dots\dots$   
 ( $\{2, 3\}$  or  $\{3\}$  or  $\{2\}$  or  $\emptyset$ )
- ⑦ The additive neutral element in  $\mathbb{N}$  is  $\dots\dots$  (1 or 0 or 2 or 3)
- ⑧  $(4 \times \dots\dots) \times 78 = 7\ 800$  (5 or 25 or 50 or 125)
- ⑨  $49 \div 8 \dots\dots \mathbb{N}$  ( $\in$  or  $\notin$  or  $\subset$  or  $\not\subset$ )
- ⑩ If x is an odd number , then  $x + 1$  is  $\dots\dots$  number.  
 (odd or even or prime)

## 2 Complete each of the following :

- ⑪ The multiplicative neutral element in  $\mathbb{N}$  is  $\dots\dots$
- ⑫ The set of natural numbers less than 7 is  $\dots\dots$
- ⑬ 1 , 1 , 2 , 3 , 5 , 8 ,  $\dots\dots$  ,  $\dots\dots$  (in the same pattern)
- ⑭ The smallest natural number is  $\dots\dots$
- ⑮  $23 \times 36 + 23 \times 64 = 23 \times (\dots\dots + \dots\dots) = \dots\dots \times \dots\dots = \dots\dots$
- ⑯ If  $9 \times 7 = 7 \times 9$  , then its called  $\dots\dots$  property.

## 3 Answer the following :

⑰ Write in the list method the set :  $X = \{x : x \in \mathbb{N}, 3 \leq x < 8\}$  , then represent its elements on the number line.

.....

⑱ If  $X = \{a : a \in \mathbb{N}, 1 \leq a < 5\}$  ,  $Y = \{4, 5, 6\}$

Find :

(1)  $X \cap Y$

(2)  $X \cup Y$

(3)  $X - Y$

.....

.....

⑲ Use the commutative and associative properties in  $\mathbb{N}$  to calculate each of the following :

(1)  $72 + 89 + 28 + 11$

(2)  $8 \times 37 \times 125$

.....

.....

⑳ Use the distributive property to get the product of :  $18 \times 99$

.....

## Unit Two

From the school book

## Exercise

6

## Mathematical expressions

1 Complete using a suitable symbolic expression :

- (a) Add 6 to the number  $x$  , the symbolic expression is .....
- (b) Subtract 3 from the number  $y$  , the symbolic expression is .....
- (c) Multiply 5 by the number  $z$  , the symbolic expression is .....
- (d) Divide the number  $m$  by 3 , the symbolic expression is .....

2 Complete the following table as the example :

	Symbol	Add 3	Subtract 7	Multiply by 3	Divide by 4
Example	$x$	$x + 3$	$x - 7$	$3x$	$\frac{x}{4}$
(a)	$y$	.....	.....	.....	.....
(b)		.....	$z - 7$	.....	.....
(c)		.....	.....	.....	$\frac{L}{4}$

3 Complete the following table :

	Verbal expression (in words)	Symbolic expression
(a)	Add 3 to the double of the number $x$	.....
(b)	Subtract 5 from the double of the number $y$	.....
(c)	Add 7 to three times of the number $z$	.....
(d)	Subtract 3 from the half of the number $x$	.....
(e)	Add 6 to one third of the number $z$	.....



## Lesson One

## 4 Translate into symbolic expression :

- (a) Add a number  $z$  to 36
- (b) Five less than a number  $x$
- (c) Nine more than a number  $x$
- (d) Subtract a number  $t$  from 24
- (e) Three times a number  $y$
- (f) Product of a number  $p$  and 7.5
- (g) Quotient of a number  $h$  by  $q$
- (h) Nine divided by a number  $x$
- (i) Seventy nine multiplied by a number  $v$
- (j) Take away a number  $k$  from 18
- (k) Seven increased by a number  $s$
- (l) A number  $w$  decreased by 5
- (m) Difference of a number  $h$  and 15 , where  $h$  is greater than 15
- (n) Three fifth a number  $n$
- (o) Divide the number  $x$  by 5 , and add 5 to the quotient.

## 5 Translate into symbolic expression :



- (a) Subtract 8 from a number
- (b) Add 5 to the three times of a number.
- (c) Add 4 to the half of a number.
- (d) Subtract 7 from one third of a number.
- (e) 7 is added to the double of a number.
- (f) 3 is subtracted from three times of a number.
- (g) Twice the sum of a number and three.
- (h) The difference of three times a number and one.

## 6 Choose the correct answer :

- (a) If we subtract 5 from the number  $x$  , we get .....  
(  $5x$  or  $5-x$  or  $x-5$  or  $x+5$  )



## Unit Two

- (b)  Suzan saved L.E.  $x$  and her father gave her L.E. 10 she will have .....
- ( $x - 10$  or  $x + 10$  or  $10x$  or  $10 - x$ )
- (c)  Subtracting 3 from double of the number  $x = \dots\dots\dots$
- ( $x - 3$  or  $2x - 3$  or  $3x + 2$  or  $5x$ )
- (d) The difference between three times a number and two is .....
- ( $3x + 2$  or  $3x - 2$  or  $2 \times 3x$  or  $\frac{3x}{2}$ )
- (e) If three times a number is added to 12 , then the expression that expresses this is .....
- ( $x + 12$  or  $x - 12$  or  $3x + 12$  or  $3x - 12$ )
- (f) Twice the sum of a number and five is .....
- ( $2x + 5$  or  $2x - 5$  or  $2(x + 5)$  or  $2(x - 5)$ )
- (g) Bassem is  $x$  years old now , how old will he be after 5 years ?
- ( $5x$  or  $5 + x$  or  $x - 5$  or  $x + 5$ )
- (h) What operations are in the symbolic expression for "twice a number increased by three" ?
- (+ and - or  $\times$  and - or  $\times$  and + or  $\times$  , + and -)

**7** Write each symbolic expression in words :

- (a)  $n - 5$                       (b)  $\frac{f}{3}$                       (c)  $c + 15$   
 (d)  $9 - y$                       (e)  $8x$



### Challenge

**8** Write a symbolic expression for each of the following :

- (a) The product of "three" and "four more than a number  $y$ "  
 (b) Five times the difference of a number  $x$  and six.

**9** Bassem runs a mile in 12 minutes. Write a symbolic expression for the number of miles that Bassem runs in  $m$  minutes.

# Exercise 7

## The constant and the variable



From the school book

1 Write down a mathematical relation between  $x$  and  $y$  for each of the following :

- If the number  $y$  is nine times the number  $x$
- If the number  $y$  is five more than the number  $x$
- If the number  $x$  is the quotient of the number  $y$  by 3
- If the number  $x$  is seven less than the number  $y$
- If the number  $x$  is 9 more than the double of  $y$
- If the number  $y$  is twice the sum of the number  $x$  and 8





2 Choose the correct answer :

- If the sum of two numbers  $x$  and  $y$  is 20 , then  $y = \dots\dots\dots$   
(  $20 + x$  or  $20 - x$  or  $x - 20$  or  $\frac{x}{20}$  )
- If the product of two numbers  $x$  and  $y$  is 10 , then  $y = \dots\dots\dots$   
(  $10x$  or  $\frac{x}{10}$  or  $\frac{10}{x}$  or  $x + 10$  )
- The sum of two numbers  $x$  and  $y$  is 15 , the smaller number is  $x$  , then  $y = \dots\dots\dots$   
(  $15 - x$  or  $x - 15$  or  $x + 15$  or  $15x$  )
- The difference of two numbers is 7 , and the smaller number is  $y$  , then the greater number is  $\dots\dots\dots$  (  $7y$  or  $7 - y$  or  $y - 7$  or  $y + 7$  )
- $x$  and  $y$  are two numbers. The greater number is 3 more than the other. If the smaller number is  $y$  , then  $x = \dots\dots\dots$   
(  $3y$  or  $y - 3$  or  $y + 3$  or  $\frac{1}{3}y$  )
- If Ahmed has L.E. 25 , and what Esslam has is less than what Ahmed has by L.E.  $x$  , then Esslam has  $\dots\dots\dots$   
(  $x + 25$  or  $25x$  or  $\frac{25}{x}$  or  $25 - x$  )

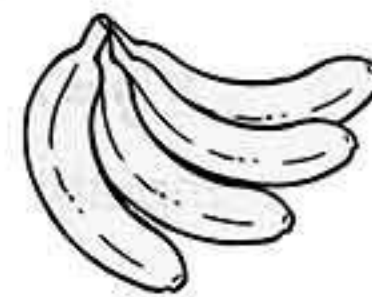



## Lesson Two

3 Complete the following :

- (a) If the sum of two numbers is 30 and one of them is  $x$  , then the other = .....
- (b)  The sum of what Manal and Nihal have is L.E. 10 If Manal has L.E.  $x$  , then Nihal will have L.E. ....
- (c) The side length of an equilateral triangle is  $l$  and its perimeter is  $p$  , then the mathematical relation between  $p$  and  $l$  is :  $p = \dots\dots\dots$
- (d) The perimeter of a square is  $p$  , and its side length is  $l$  , then the mathematical relation between  $p$  and  $l$  is :  $p = \dots\dots\dots$
- (e) The side length of a rhombus is  $x$  and its perimeter is  $p$  , then the mathematical relation between  $p$  and  $x$  is :  $p = \dots\dots\dots$
- (f)  The perimeter of a rectangle is 20 cm. If its length is  $x$  cm. , then its width = .....
- (g) If the area of a rectangle is  $A$  and whose length is  $x$  and width is 5 cm. then :  $A = \dots\dots\dots$
- (h)  The lengths of two adjacent sides of a parallelogram are  $x$  and  $y$  , then its perimeter = .....
- (i)  The length of a rectangle is 3 cm. more than its width. Let the length be  $l$  cm. , then the width will be ..... cm.

4 If the price of 1 kg. of banana is L.E. 6 , the price of  $x$  k.g. of banana is  $y$  , then write a mathematical relation between  $x$  and  $y$

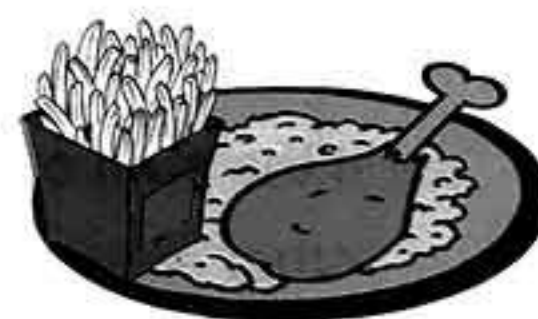


5  Medhat bought  $x$  kg. of chocolate and put it in a box that costs L.E. 5 Calculate what Medhat should pay in terms of  $x$  if the price of 1 kg. of chocolate is L.E. 28




## Unit Two

- 6 The price of a meal in a restaurant is L.E. 25 , and L.E. 3 are added for delivery service , it does not matter , how many meals.



If  $x$  is the number of meals Bassem order , and  $y$  is the total price he has to pay , then write a mathematical relation between  $x$  and  $y$

Find the total price Bassem has to pay if he order 3 meals.

- 7  The owner of a factory pays the daily wage of one of his workers according to the mathematical relation  $y = 12 + 5X$

Where  $X$  represents number of working hours done in overtime and  $y$  represents the daily wage in L.E.




- (a) Complete :

The constant daily wage = L.E. ....

The constant daily wage and overtime wage = L.E. ....

- (b) Complete the following table that shows the mathematical relation of the daily wage according to the overtime hours :

Number of overtime hours ( $x$ )	0	1	2	.....	.....	5
Total daily wage ( $y$ )	.....	.....	.....	27	32	.....

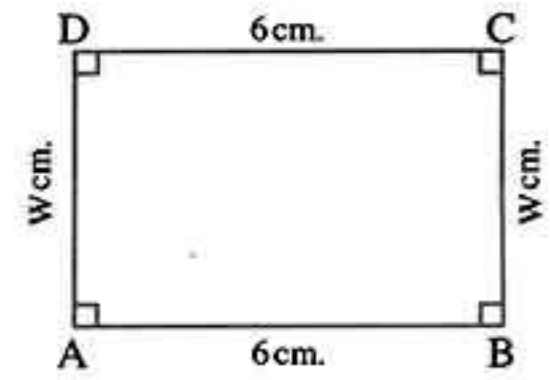
- 8  If  $y = 4x$  is the mathematical relation between  $x$  and  $y$  , then complete the table :

$x$	3	1	5	.....	.....	.....
$y$	.....	.....	.....	24	16	28

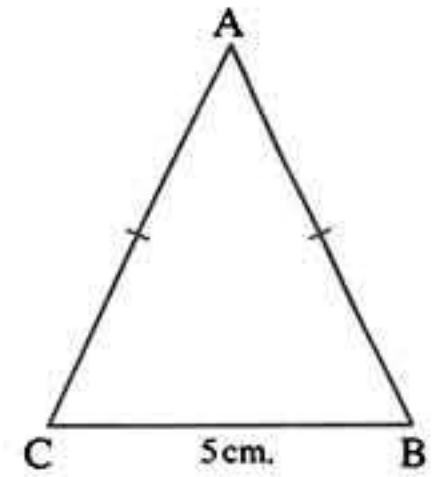


## Lesson Two

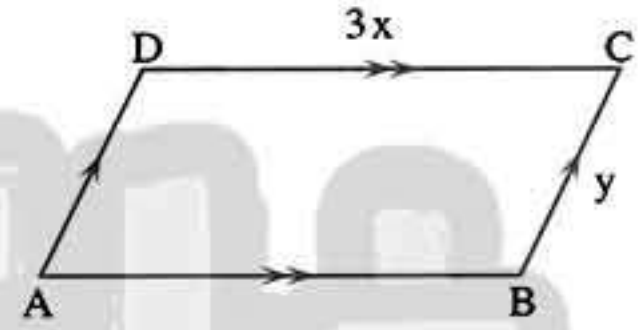
- 9 A rectangle whose length is 6 cm. and whose width is  $w$  cm. , if its perimeter is  $p$  , write a mathematical relation between  $p$  and  $w$  , then find  $p$  when  $w = 4$  cm.



- 10 An isosceles triangle with base 5 cm. Find the mathematical relation between the lengths of its sides and its perimeter. Let  $p$  represent the perimeter of the triangle ABC and  $l$  represent the length of  $\overline{AB}$



- 11 A parallelogram , the lengths of its two adjacent sides are  $3x$  and  $y$  , if its perimeter is  $p$  , write a mathematical relation between  $p$  ,  $x$  and  $y$  , then find  $p$  if  $x = 2$  and  $y = 3$



## Challenge

- 12 If you buy 5 pens for L.E.  $x$  each and 3 rulers for L.E.  $y$  each. Find the total cost  $c$  in terms of  $x$  and  $y$

## Unit Two

From the school book

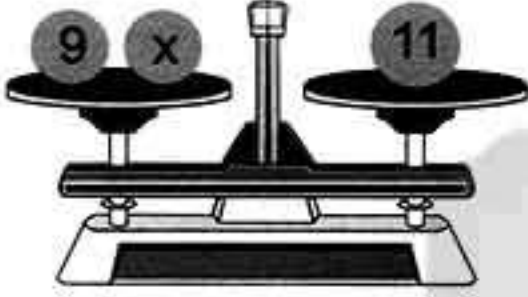
## Exercise

## 8

## Equations

1 In each of the following figures, the two pans of the scale are balanced as in the first case :

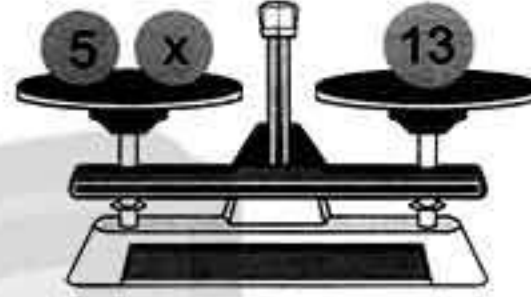
(a)



Equation :  $x + 9 = 11$

Solution :  $x = 2$

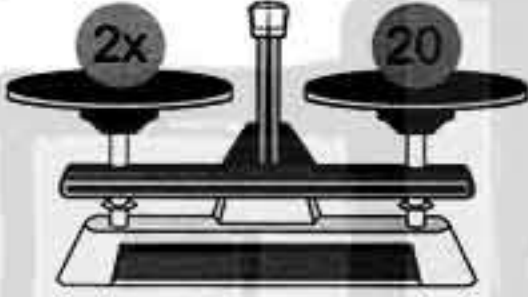
(b)



Equation : .....

Solution : .....

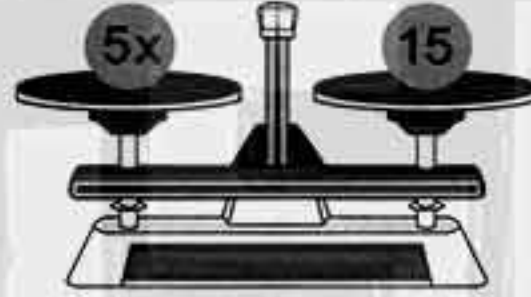
(c)



Equation : .....

Solution : .....

(d)



Equation : .....

Solution : .....

2 Solve each of the following equations :

(a)  $x + 3 = 12$

(b)  $x + 8 = 15$

(c)  $x - 7 = 25$

(d)  $y - 5 = 7$

(e)  $8 + z = 8$

(f)  $9 + y = 44$

(g)  $3x = 27$

(h)  $4x = 16$

(i)  $37y = 37$

(j)  $5a = 0$

(k)  $\frac{1}{6}x = 12$

(l)  $\frac{1}{5}y = 1$

(m)  $70 = 50 + t$

(n)  $16 = n - 3$

(o)  $48 = 4y$

3 Solve each of the following equations :

(a)  $2x + 9 = 21$

(b)  $3y - 5 = 7$

(c)  $3x + 8 = 29$

(d)  $2y - 12 = 2$

(e)  $\frac{1}{3}x + 8 = 10$

(f)  $\frac{1}{6}x - 3 = 2$



## Lesson Three

**4** Solve each of the following equations :

(a)  $20 - x = 16$

(b)  $15 - y = 10$

**5** Underline the solution of each of the following equations :

(a)  $p + 4 = 18$  , (4 , 22 , 14 , 72)

(b)  $10m = 90$  , (9 , 100 , 10 , 90)

(c)  $k \div 6 = 6$  , (36 , 12 , 6 , 0)

(d)  $x - 150 = 50$  , (200 , 150 , 100 , 3)

(e)  $\frac{y}{12} = 3$  , (15 , 4 , 36 , 39)

(f)  $4x - 4 = 12$  , (1 , 2 , 4 , 8)

(g)  $3y + 5 = 29$  , (34 , 24 , 8 , 6)

**6** Choose the correct answer :

(a) If  $x + 5 = 11$  , then :  $x = \dots\dots\dots$  (5 or 8 or 7 or 6)

(b) If  $16 - y = 3$  , then :  $y = \dots\dots\dots$  (19 or 6 or 13 or 12)

(c) If  $z \times 9 = 63$  , then :  $z = \dots\dots\dots$  (7 or 9 or 8 or 6)

(d) If  $k \div 8 = 7$  , then :  $k = \dots\dots\dots$  (15 or 1 or 56 or 8)

(e) If  $25 \div p = 5$  , then :  $p = \dots\dots\dots$  (20 or 5 or 30 or 1)

(f) If  $3x + 1 = 19$  , then :  $x = \dots\dots\dots$  (18 or 12 or 8 or 6)

(g) If  $2y - 4 = 6$  , then :  $y = \dots\dots\dots$  (6 or 5 or 2 or 1)

(h) If  $3x = 12$  , then :  $\frac{1}{2}x = \dots\dots\dots$  (9 or 6 or 4 or 2)

(i) If  $6y = 18$  , then :  $5y = \dots\dots\dots$  (3 or 5 or 15 or 30)

(j) If  $y \div 2 = 8$  , then :  $\frac{1}{4}y = \dots\dots\dots$  (2 or 4 or 6 or 8)


**7** Translate each verbal statement into an equation :


(a) The sum of the number  $x$  and 6 is 9

(b)  $\square$  A number if added to 17 the sum is 28

(c)  $\square$  If 9 is subtracted from a number , then the result is 23


## Unit Two

- (d) Three times of a number is 12  
 (e)  If 5 is subtracted from 3 times of a number , then the result is 16  
 (f) 10 is 8 more than twice the number x  
 (g) Bassem saved L.E. 15 , he bought 3 pens for L.E. x each , the remainder with him is L.E. 9

8  Find the number which if added to 3 , the sum is 9

9 The product of a number x and 6 is 42 , find the number x

10 Wael saved L.E. 16 , he bought a notebook for L.E. x , the remainder with him is L.E. 10 , find the price of the notebook.

11  Write down a real life situation that represents each of the following equations :


(a)  $x + 7 = 29$

(b)  $x - 5 = 19$

(c)  $40 - y = 32$



## Mental Math

12  Find the value of X in the following :

(a)  $22 + x = 9 + 22$

(b)  $35 + x = 18 + 35$

(c)  $7x = 117 \times 7$

(d)  $12 \times (17 \times x) = (12 \times 17) \times 32$

(e)  $3 \times 52 = (x \times 2) + (x \times 50)$

(f)  $(7 \times 9) + (x \times 5) = 7 \times 14$

13 Solve each of the following equations :

(a)  $24x = 61 \times 24$

(b)  $6 \times 14 = 6 \times (x + 5)$

(c)  $8 \times 45 = x(35 + 10)$

(d)  $(x + 2) \times 7 = 7 \times 8$

(e)  $573 = x + (7 \times 10) + (5 \times 100)$

(f)  $482 = (4 \times x) + (8 \times 10) + 2$

(g)  $42 = 2 + x \times 10$

(h)  $x \times 7 + x \times 50 = 2 \times 57$

(i)  $75 = 5x + 7 \times 10$





## Lesson Three



## Challenge

**14** Put the suitable signs + , - , ÷ or × so the equation has the given solution :

- (a) The solution of the equation  $x \dots\dots 17 = 51$  is 3  
 (b) The solution of the equation  $y \dots\dots 5 = 150$  is 750  
 (c) The solution of the equation  $z \dots\dots 73 = 21$  is 94  
 (d) The solution of the equation  $t \dots\dots 34 = 42$  is 8  
 (e) The solution of the equation  $35 \dots\dots m = 7$  is 5  
 (f) The solution of the equation  $67 \dots\dots p = 92$  is 25  
 (g) The solution of the equation  $76 \dots\dots t = 4$  is 19  
 (h) The solution of the equation  $315 \dots\dots u = 299$  is 16

**15** Observe and complete :

If  $\blacktriangle + \blacklozenge + \blacklozenge = 120$

and

$\blacktriangle + \blacklozenge = 75$

, then  $\blacklozenge = \dots\dots$

and

$\blacktriangle = \dots\dots$

Rania Sayed

## Unit Two

## General exercise on unit two

### From the school book

#### First Completion questions

Complete each of the following to get a correct statement :

- ① If we add 3 to twice the number (x) , then we will get the number .....
- ② If we add 5 to three times the number (y) , then we shall get the number .....
- ③ If we subtract 8 from twice the number (z) , then we shall get the number .....
- ④ If we divide the number (x) by 3 and add 3 to the quotient , then we shall get the number .....
- ⑤ If we multiply the number (L) by 5 , then we subtract from the result 6 , then we shall get the number .....
- ⑥ If  $16 - x = 9$  , then  $x =$  .....
- ⑦ If  $4 + x = 18$  , then  $x =$  .....
- ⑧ If  $3x + 7 = 19$  ,  $x \in \mathbb{N}$  , then  $x =$  .....
- ⑨ If  $(x + 2) \times 15 = 8 \times 15$  , then  $x =$  .....
- ⑩ The length of a rectangle exceeds the width by 5 , if the width of the rectangle = x cm. , then its length = ..... cm.
- ⑪ The width of a rectangle is x cm. , its length is longer than twice its width by 3 cm. , then the length of the rectangle is ..... cm.
- ⑫ A rectangle in which the length is more than its width by 4 cm. If the length of the rectangle is x cm. , then its width = ..... cm.
- ⑬ The perimeter of a rectangle is 16 cm. and its width = x , then length = ..... cm.
- ⑭ The sum of two numbers is 35 , one of them is x , then the other is .....
- ⑮ The product of two numbers = 42 , one of them is x , then the other is .....
- ⑯ If  $35 + (12 + x) = (35 + 12) + 19$  , then  $x =$  .....
- ⑰ If  $37 \times 15 = (7 + x) \times 15$  , then  $x =$  .....
- ⑱ If  $15 \times 34 = (5 + 10) \times x$  , then  $x =$  .....



## General exercise

## Second Multiple-choice questions

Choose the correct answer from those given :

- ① The difference between two numbers is 5 the smaller one is  $y$  , then the greater number is ..... (  $5y$  or  $5-y$  or  $y-5$  or  $y+5$  )
- ② If  $x + 8 = 15$  ,  $x \in \mathbb{N}$  , then  $x =$  ..... (  $23$  or  $7$  or  $6$  or  $5$  )
- ③ If  $x - 3 = 5$  ,  $x \in \mathbb{N}$  , then  $x =$  ..... (  $8$  or  $2$  or  $6$  or  $7$  )
- ④  $x$  and  $y$  are two numbers where their sum is 20 , then  $y =$  .....  
(  $20 + x$  or  $20 - x$  or  $x - 20$  or  $\frac{x}{20}$  )
- ⑤ If we multiply the number  $x$  by 7 , then we subtract from the result 3 we shall get ..... (  $7x + 3$  or  $3x + 7$  or  $7x - 3$  or  $x - 21$  )
- ⑥ The sum of the two numbers is 15 , the smaller number is  $x$  , then the greater number is ..... (  $x + 15$  or  $15x$  or  $15 - x$  or  $x - 15$  )
- ⑦ If Mahmoud has L.E. 15 and what Abu Zeid has is less than what Mahmoud has by  $x$  pounds , then Abu Zeid has .....  
(  $x + 15$  or  $15 - x$  or  $15x$  or  $\frac{15}{x}$  )
- ⑧ If the side length of a rhombus is  $x$  , its perimeter is  $P$  , then the mathematic relation between  $x$  and  $P$  is  $P =$  .....  
(  $4x$  or  $x + 4$  or  $x - 4$  or  $4 - x$  )
- ⑨ If the side length of an equilateral triangle is  $L$  and its perimeter  $P$  , then the mathematic relation between  $P$  and  $L$  is  $P =$  .....  
(  $L + 3$  or  $\frac{1}{3}L$  or  $3L$  or  $L - 3$  )
- ⑩ Double the number  $x$  subtracted 7 from it equals .....  
(  $x - 7$  or  $2x - 7$  or  $7x + 2$  or  $14x$  )

## Third Essay questions

Solve each of the following equations :

①  $3x + 8 = 29$

②  $5x - 7 = 33$

③  $\frac{1}{3}x + 8 = 10$

④  $\frac{1}{7}x - 3 = 2$

## Test on Unit Two



## 1 Choose the correct answer from the given ones :

- ① If  $y = x + 5$  , then the constant is ..... (  $x$  or  $y$  or  $5$  )
- ② If the side length of a square is  $m$  and its perimeter is  $P$  , then  $P =$  .....  
(  $m + 4$  or  $4m$  or  $m - 4$  or  $4 - m$  )
- ③ Subtracting 3 from double of the number  $k =$  .....  
(  $k - 3$  or  $2k - 3$  or  $3k + 2$  or  $5k$  )
- ④ If  $3a = 15$  ,  $a \in \mathbb{N}$  , then  $a =$  ..... (  $12$  or  $5$  or  $\frac{1}{5}$  or  $\frac{1}{3}$  )
- ⑤ The difference between two numbers is 8 , the smaller one is  $y$  , then the greater number is ..... (  $8y$  or  $8 - y$  or  $y - 8$  or  $y + 8$  )
- ⑥ If  $x + 5 = 12$  ,  $x \in \mathbb{N}$  , then  $x - 5 =$  ..... (  $7$  or  $5$  or  $2$  or  $12$  )
- ⑦ If the sum of two numbers  $x$  and  $y$  is 10 , then  $y =$  .....  
(  $10 + x$  or  $10 - x$  or  $x - 10$  or  $\frac{x}{10}$  )
- ⑧ If  $(6 \times 9) + (x \times 5) = 6 \times 14$  , then  $x =$  ..... (  $5$  or  $9$  or  $14$  or  $6$  )

## 2 Complete each of the following :

- ⑨ If  $7 \times 15 = 15 \times c$  ,  $c \in \mathbb{N}$  , then  $c =$  .....
- ⑩ If we multiply the number  $f$  by 7 , then we subtract 2 from the result , then we get .....
- ⑪ The perimeter of an equilateral triangle whose side length is  $L$  cm.  
 $=$  ..... cm.
- ⑫ If  $16 - x = 6$  where  $x \in \mathbb{N}$  , then  $x =$  .....

## 3 Answer the following :

- ⑬ Ahmed has L.E.  $x$  , Samir has L.E. 10 and the sum of what Samir has and the twice of what Ahmed has is L.E. 24

Write an equation to represent this situation and find the value of  $x$

.....

.....

- ⑭ Solve each of the following equations where  $x \in \mathbb{N}$  :

①  $x + 2 = 5$

.....

.....

②  $2x + 9 = 17$

.....

.....

③  $x - 4 = 6$

.....

.....

④  $\frac{1}{2}x - 5 = 3$

.....

.....



## Lesson Three

From the school book

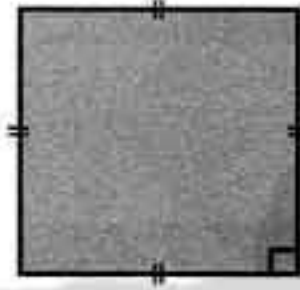
**Exercise 3** Area of square in terms of its diagonal length

1 Complete :

- (a) The area of the square = the side length  $\times$  .....
- (b) The area of the square =  $\frac{1}{2} \times$  .....  $\times$  .....
- (c) If the side length of the square = 4 cm. , then its area = .....  $\text{cm}^2$
- (d) If the length of the diagonal of the square = 10 cm. , then its area = .....  $\text{cm}^2$

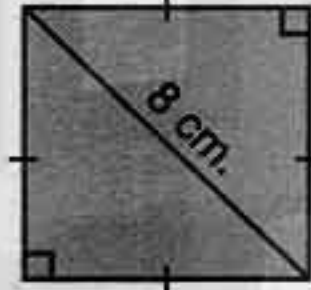
2 Find the area of each of the following squares :

(a)

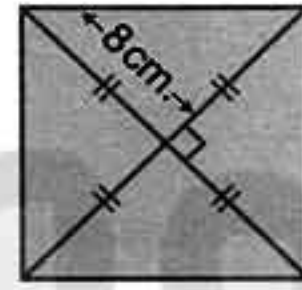


4.4 cm.

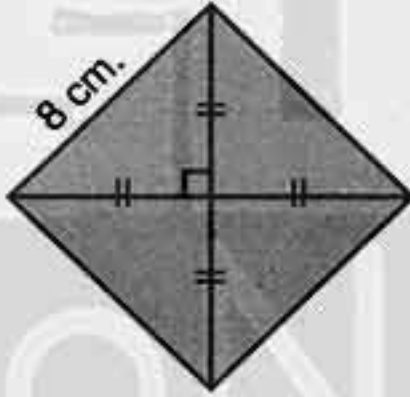
(b)



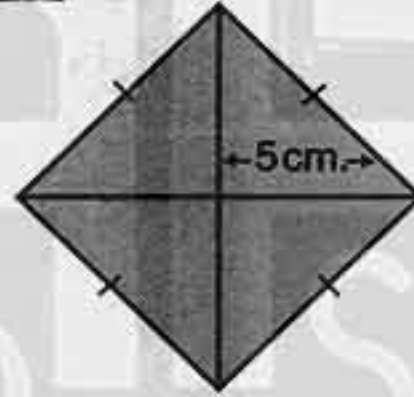
(c)



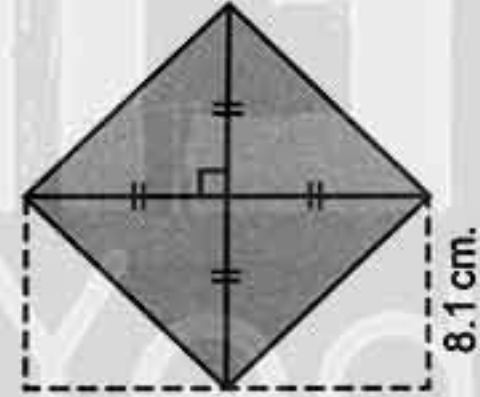
(d)



(e)



(f)



3 A square is of side length 7 cm. , find its area.

4 The diagonal length of a square is 6 cm. , find its area.

5 If the length of the diagonal of a square is 5.4 cm. , then find its area.

6 A square has a side length of 1.6 m. , find its area.

7 If the area of a square is  $64 \text{ cm}^2$ . , find its side length and its perimeter.8 The area of a square is  $24.5 \text{ cm}^2$ . , find the length of its diagonal.

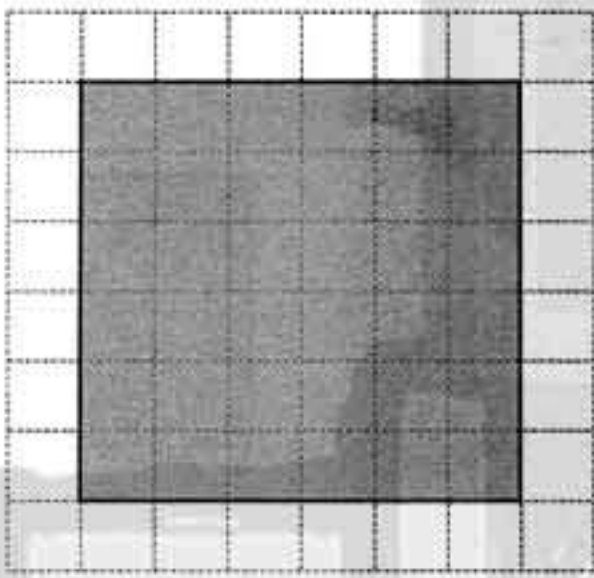
9 Find the area of a square whose perimeter is 12 cm.

10 Which is greater in area : a square of side length 9 cm. or another square of diagonal length 12 cm. ?

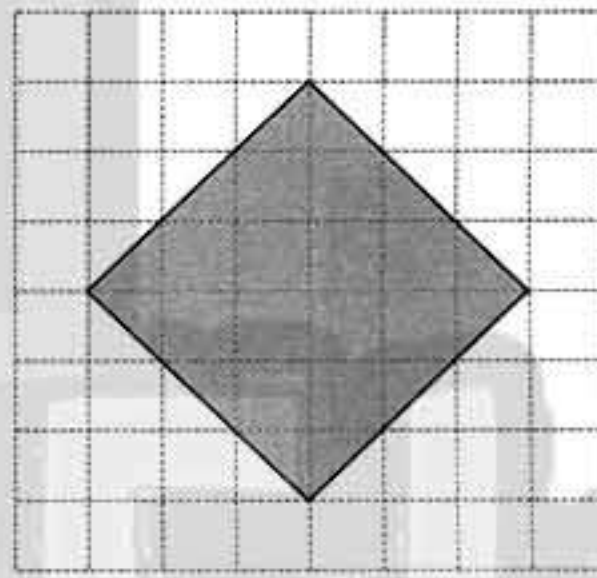
## Unit Three

- 11 Which is greater in area : a square whose diagonal is 10 cm. or a right-angled triangle whose right angle sides are 8 cm. and 15 cm.
- 12 The area of a square equals the area of the rectangle whose dimensions are 2 cm. and 9 cm. Find the length of the diagonal of the square.
- 13 Two pieces of land are equal in area. The first is a square-shaped and the second is a rectangle of length 9 m. and width 4 m. Find the perimeter of the square piece.
- 14 Calculate the area of each of the following :

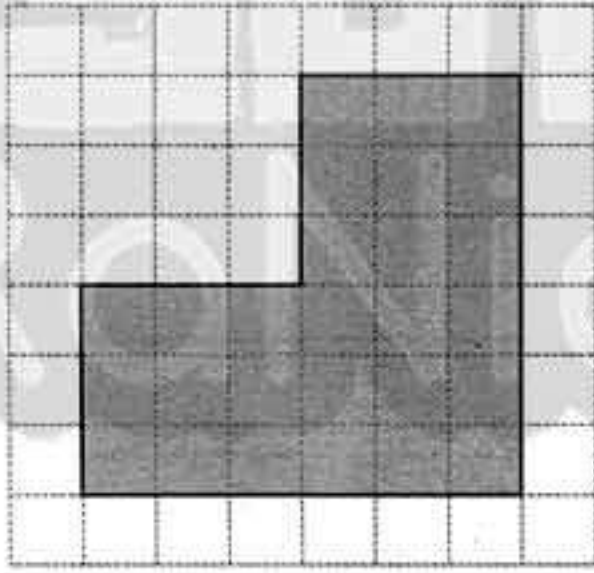
(a)



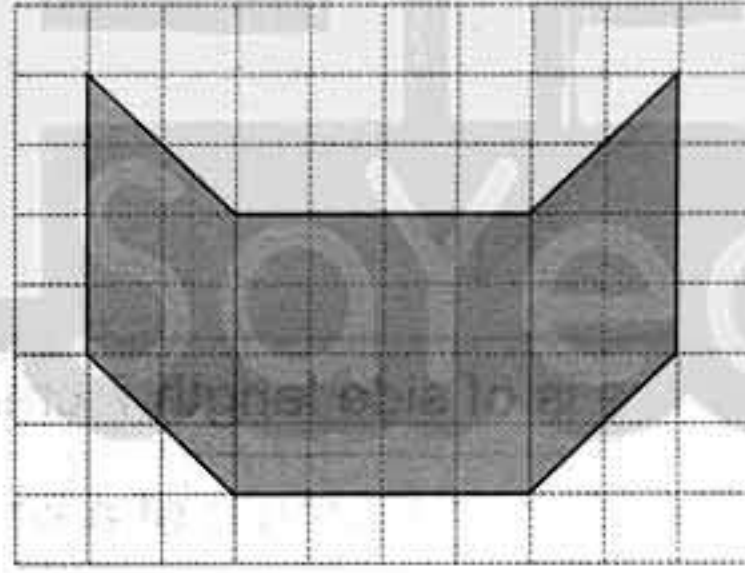
(b)




(c)




(d)



- 15  A square shaped piece of land with diagonal length 28 m. A square shaped house with side length 15 m. has been built on it and the left part was used as a garden. Find the area of the garden.



- 16  A piece of land has the shape of a parallelogram whose base length is 18 m. and its corresponding height is 10 m. A flower basin has the shape of a square whose diagonal length is 7 m. Find the area of the surface left.



## Lesson Three

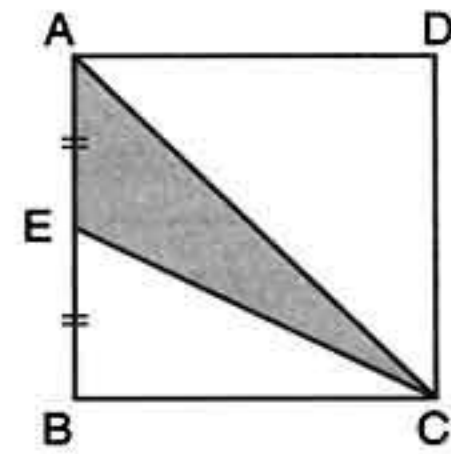
**17** A piece of land has the shape of a square whose diagonal length is 24 m. , inside this piece of land , a house was built that has a square base whose side length is 12 m. , and the rest of the area was planted as a garden for this house. Find the area of this garden.

**18** The area of a piece of paper is  $312.5 \text{ cm}^2$  if 7 congruent squares with diagonal lengths of each 9 cm. are cut off. Find the area of the left part of the paper.

**19** In the opposite figure :

ABCD is a square , E is the midpoint of  $\overline{AB}$  , the area of the square ABCD equals  $36 \text{ cm}^2$

Find the area of  $\triangle AEC$



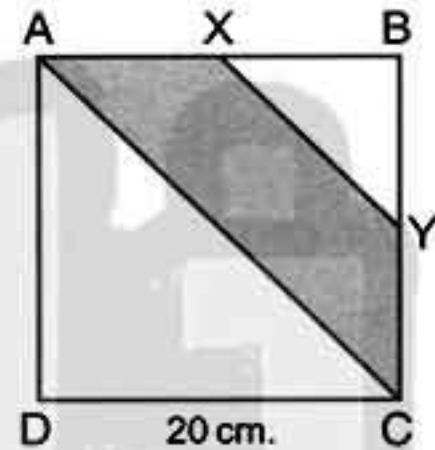
**20** In the opposite figure :

ABCD is a square of side length = 20 cm.

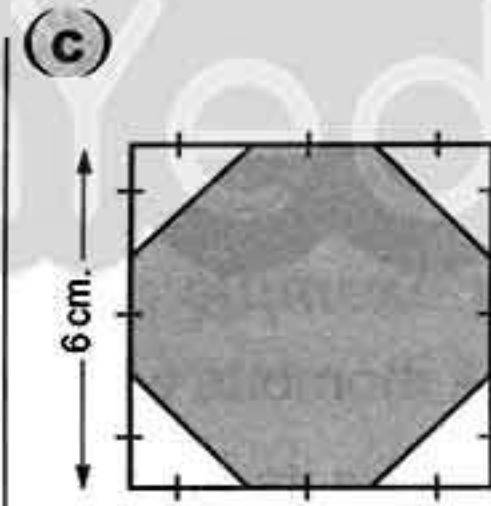
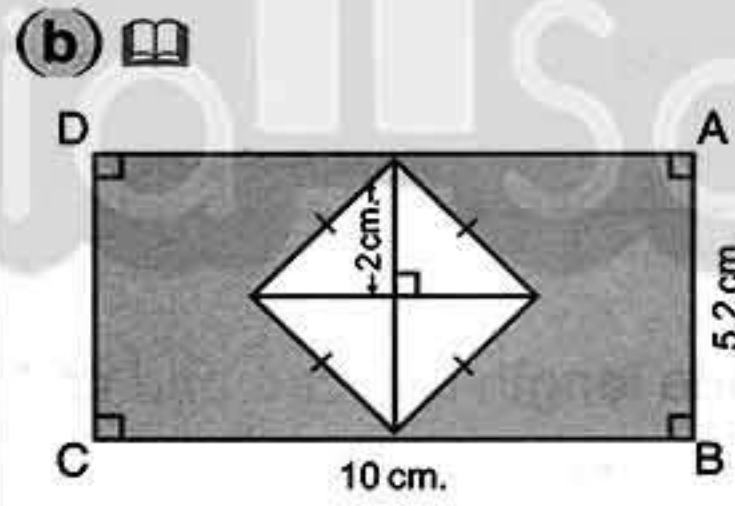
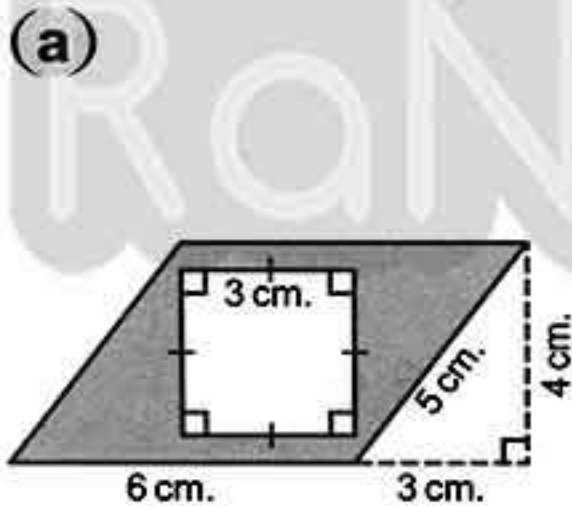
, X is the midpoint of  $\overline{AB}$

, Y is the midpoint of  $\overline{BC}$

, then find the area of the shaded part.



**21** Find the area of the shaded part :



## Challenge

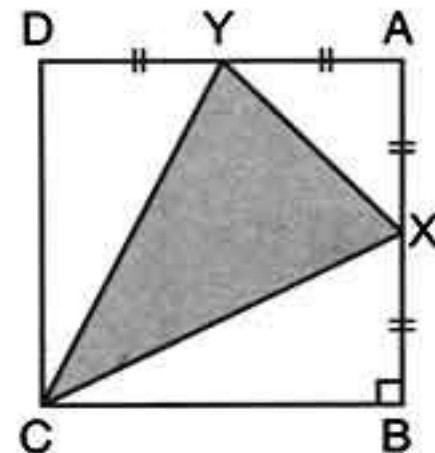
**22** In the opposite figure :

The area of the square ABCD =  $64 \text{ cm}^2$

, X is the midpoint of  $\overline{AB}$

, Y is the midpoint of  $\overline{AD}$

Find the area of  $\triangle XYC$





## Unit Three

From the school book

## Exercise

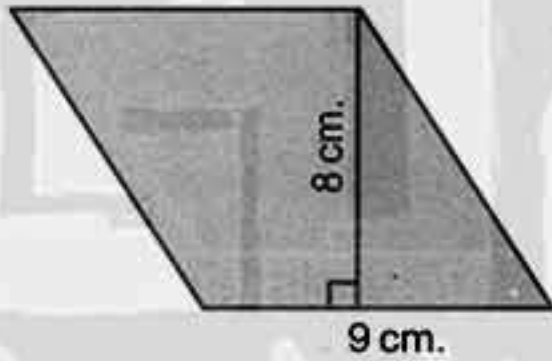
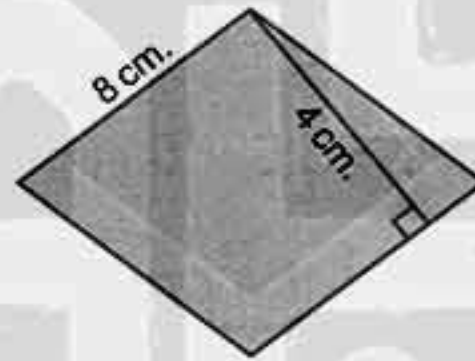

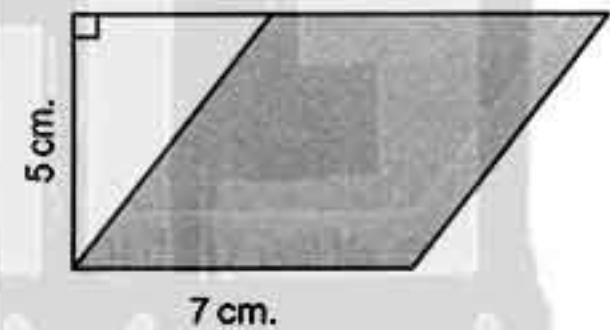
4

## Area of rhombus in terms of its diagonal lengths

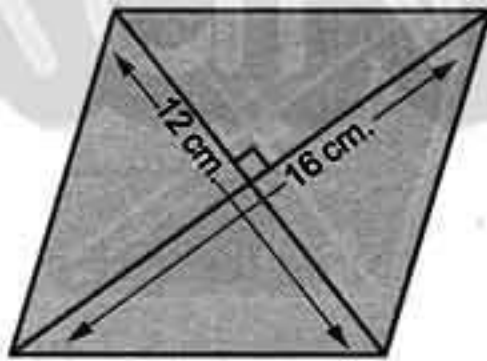
1 Complete :

- (a) The area of the rhombus = the side length  $\times$  .....
- (b) The area of the rhombus =  $\frac{1}{2} \times$  the product of .....
- (c) If the lengths of the diagonals of a rhombus are 20 cm. and 10 cm. , then its area = .....  $\text{cm}^2$
- (d) A rhombus is of side length 12 cm. and its height = 4 cm. , then its area = .....  $\text{cm}^2$

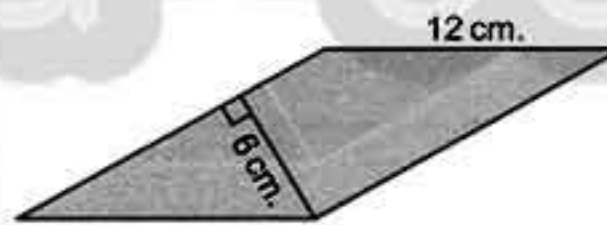
2 Find the area of each of the following rhombuses :

(a) (b) (c) 

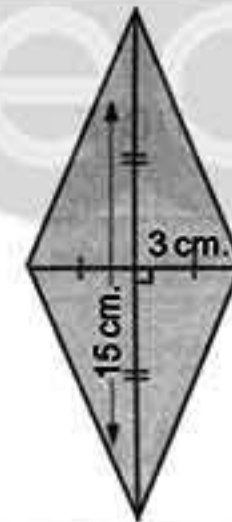
(d)



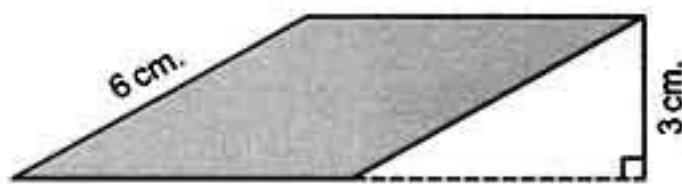
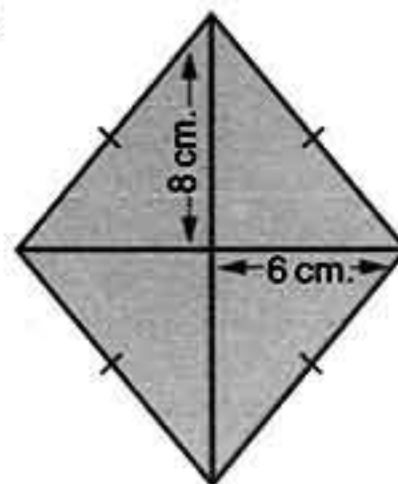
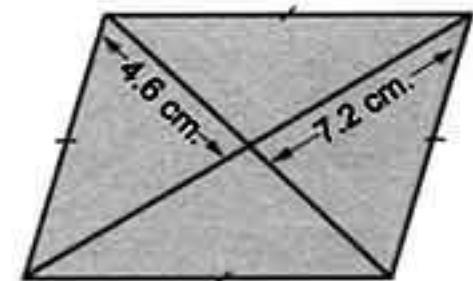
(e)



(f)



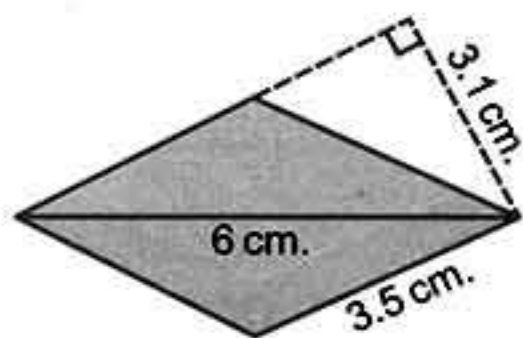
(g)

(h) (i) 

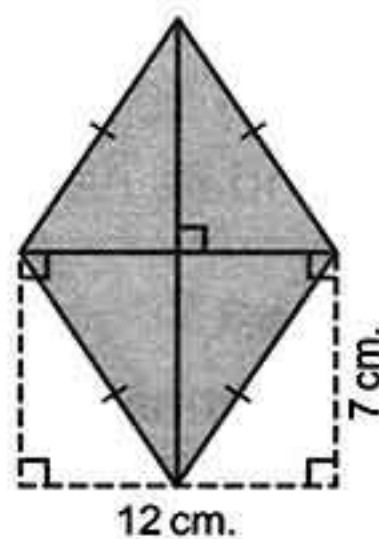


## Lesson Four

(j)



(k)



3 A rhombus of side length = 6 cm. and its height is 5 cm. Find its area.

4 The lengths of the diagonals of a rhombus are 3.4 cm. and 5.5 cm. Find its area.

5 If the area of a rhombus is  $26 \text{ cm}^2$ . and its side length equals 6.5 cm. Find its height.

6 If the height of a rhombus is 10 cm. and its area =  $54 \text{ cm}^2$ . Find its side length.

7 The area of a rhombus is  $20 \text{ cm}^2$ . and the length of one of its diagonals is 5 cm. , then find the length of the other diagonal.

8 The area of a rhombus is  $240 \text{ cm}^2$ . and the length of one of its diagonals is 0.2 m. , then find the length of the other diagonal.

9 Complete the following table :

Diagonal length of rhombus	The other diagonal length of rhombus	Area of rhombus in square units
3 cm.	5.4 cm.	..... $\text{cm}^2$
2.3 cm.	..... cm.	$4.6 \text{ cm}^2$
24 mm.	3 cm.	..... $\text{mm}^2$
27 cm.	..... dm.	$8.1 \text{ dm}^2$
1.7 m.	..... cm.	$3.4 \text{ m}^2$


## Unit Three

10 Which is greater in area ?

A triangle of base length 10 cm. and its height 6 cm. or a rhombus whose side length is 7 cm. and its height is 4 cm.

11 Which is smaller in area ?

A rhombus whose diagonals lengths are 8 cm. and 5 cm. or a square whose diagonal length is 7 cm.


12  Which figure has greater area ?


A parallelogram whose base length is 5.4 cm. and its corresponding height is 4.1 cm. or a rhombus with diagonal lengths 5.4 cm. and 4.1 cm.

13 Find the area of a rhombus of side length = 8 cm. and its height equals twice its side length.

14 Find the area of a rhombus if the length of its smaller diagonal = 3 cm. and its greater diagonal equals three times the smaller one.

15 Find the area of the rhombus whose perimeter is 36 cm. and its height is 5.2 cm.

16  Find the area of a rhombus with diagonal lengths 7 cm. and 9 cm. and if its height is 5 cm. , find its side length.

17  If the area of a parallelogram with base length 12 cm. and its corresponding height of 6 cm. is equal to the area of a rhombus with a diagonal length 10 cm. , then find the length of the other diagonal of the rhombus.

18 Two pieces of land have the same area. The first is in the shape of a square and the second is in the shape of a rhombus with diagonals equal to 8 m. and 16 m. long. Find the perimeter of the square piece of land.

19 If the perimeter of a rhombus is 24 cm. and its area is  $30 \text{ cm}^2$ . , then find its height.

20 The side length of a rhombus is 5 cm. , its height is 4.8 cm. and the length of one of its diagonals is 6 cm. Calculate the length of the other diagonal.

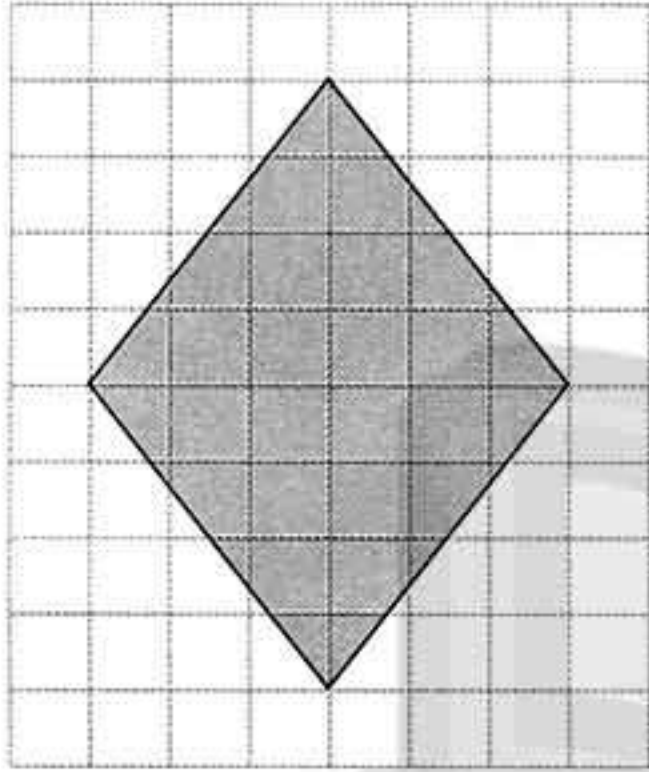


## Lesson Four

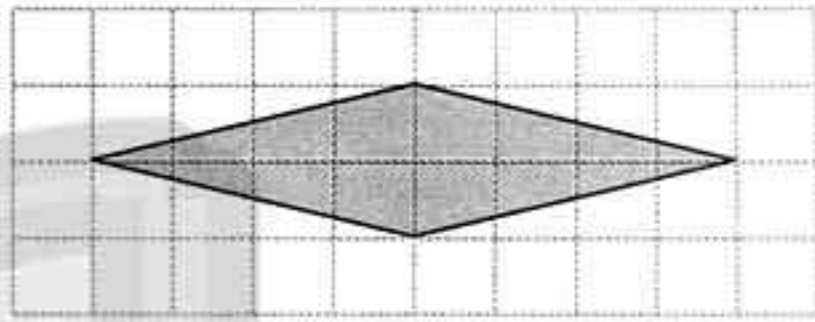
21 If the product of the lengths of the diagonals of a rhombus is  $96 \text{ cm}^2$ . and its height is  $6 \text{ cm}$ . , then find the length of its side.

22 Calculate the area of each of the following :

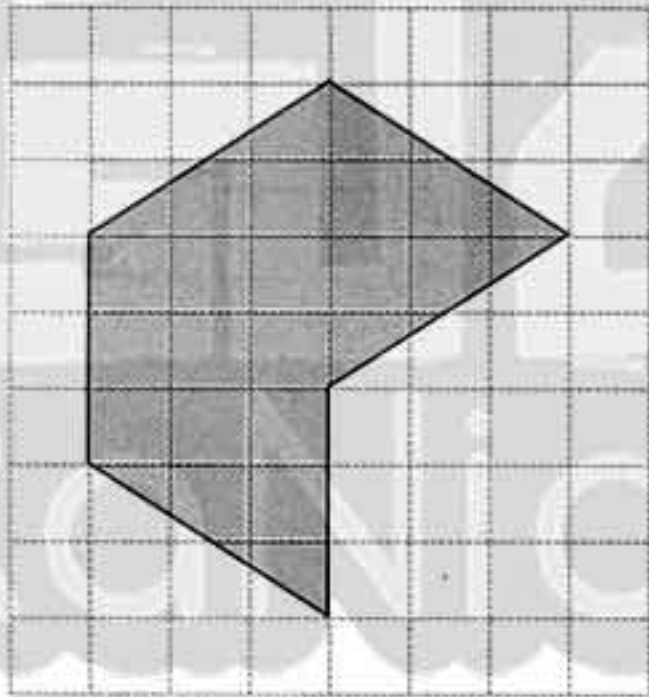
(a)



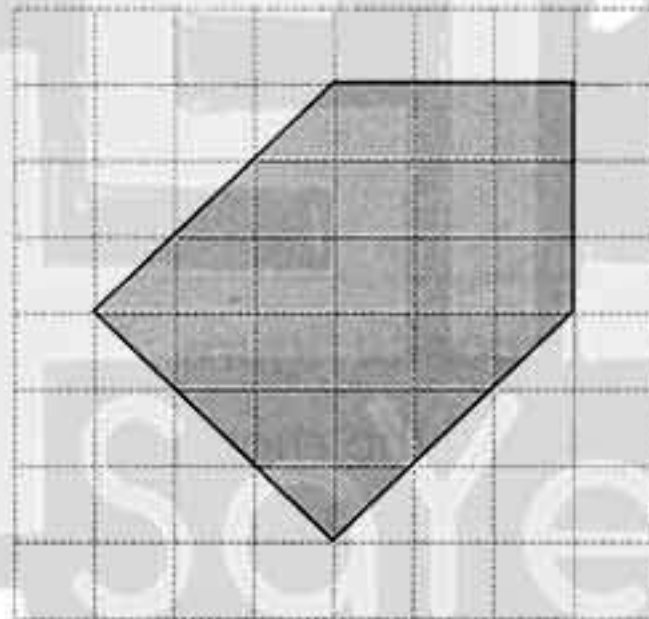
(b)



(c)

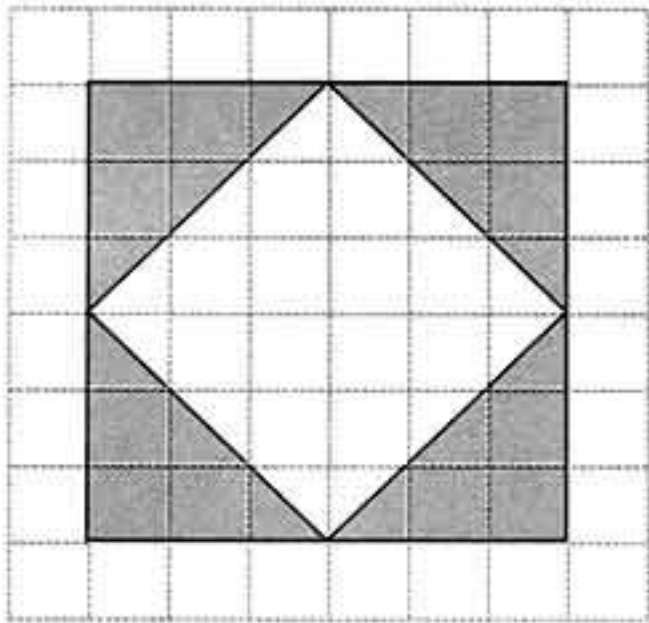


(d)

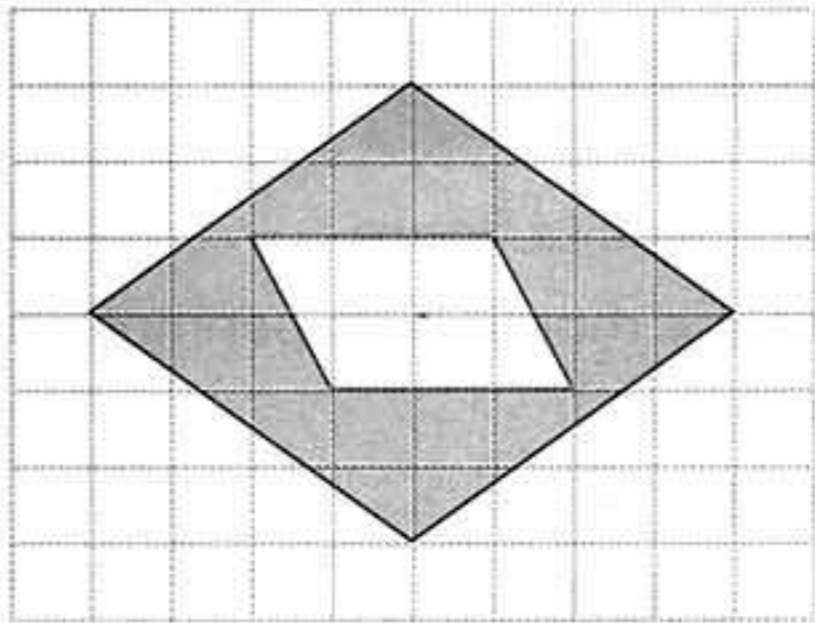


23 Calculate the area of the coloured region :

(a)

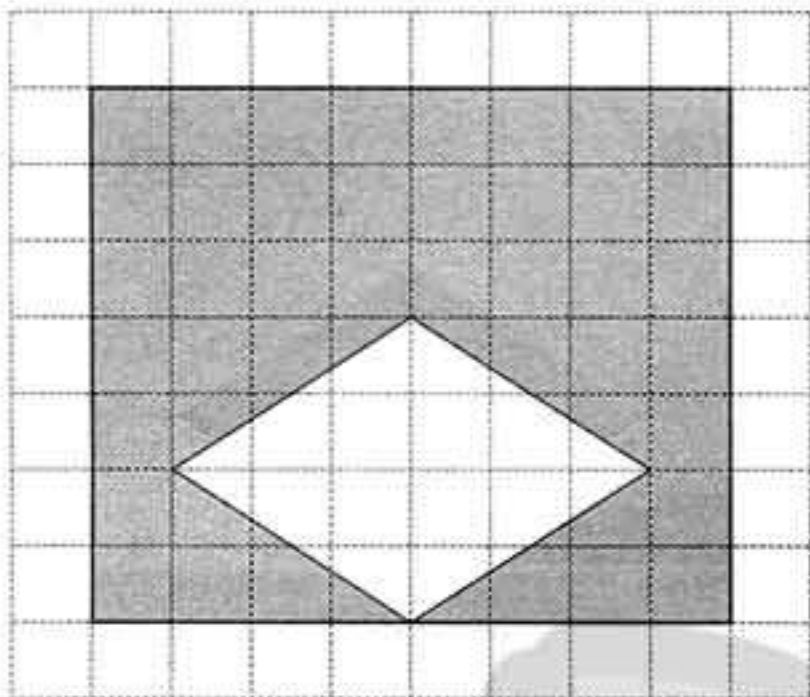


(b)

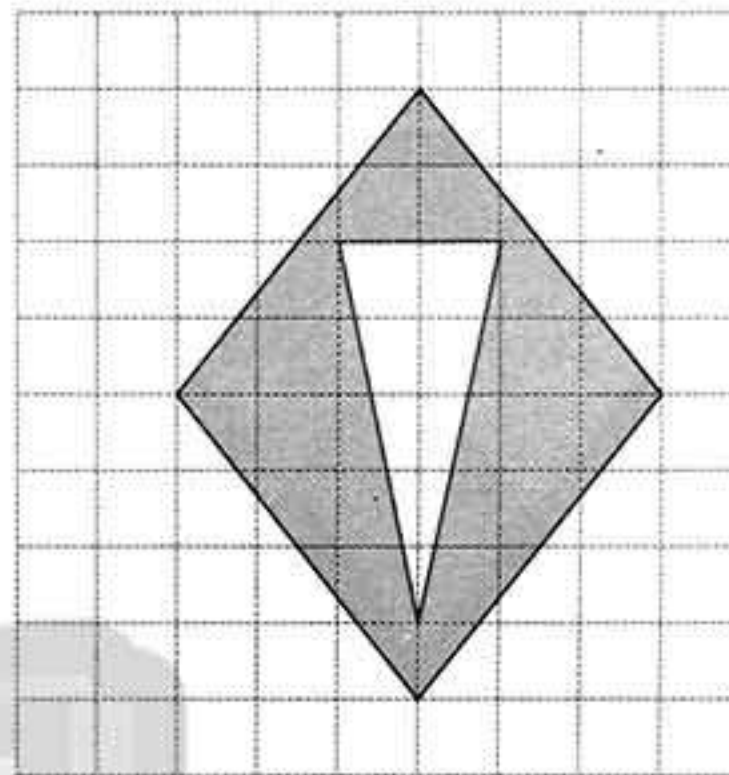


Unit Three

(c)

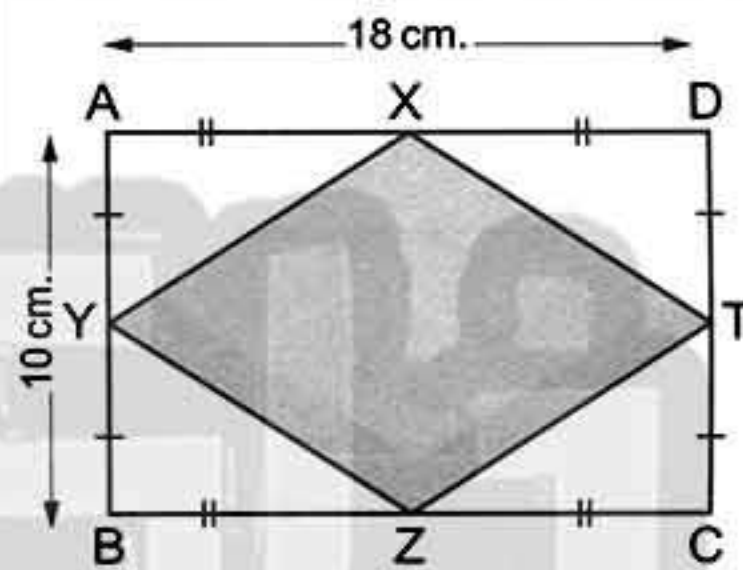


(d)



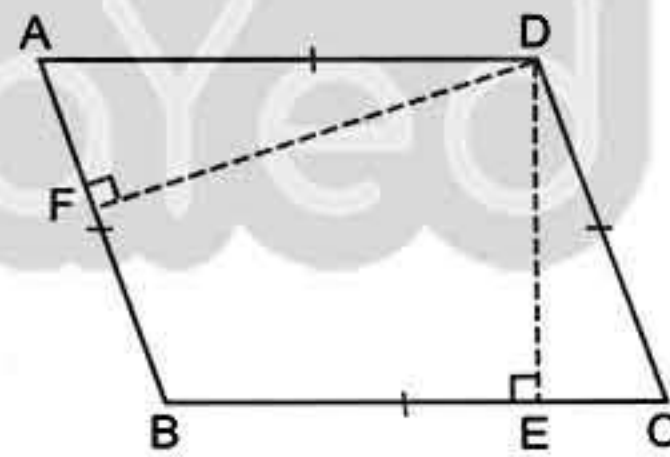
24 In the opposite figure :

ABCD is a rectangle  
and XYZT is a rhombus.  
If  $AB = 10\text{ cm.}$  ,  $AD = 18\text{ cm.}$  ,  
Find the area of the rhombus  
XYZT



25 In the opposite figure , find :

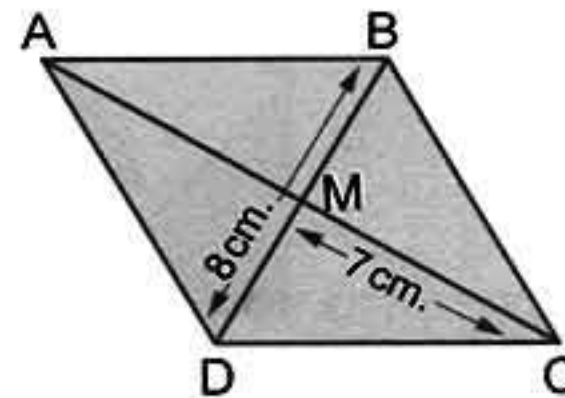
- (a) The area of the rhombus ABCD , whose side length is 10 cm. and diagonal lengths are 16 cm. and 12 cm.
- (b) The length of  $\overline{DE}$  , and  $\overline{DF}$ .  
What can you say about the heights of rhombus ?



Challenge

26 In the opposite figure :

ABCD is a rhombus its perimeter is 32 cm.  
If  $BD = 8\text{ cm.}$   
and  $CM = 7\text{ cm.}$  ,  
Find its height.



## Unit Three

From the school book

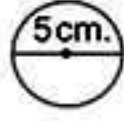
## Exercise

5

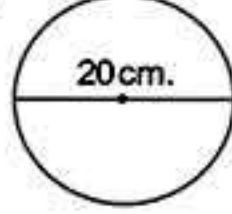
## Circumference of a circle

1 Find each circumference of the following : " $\pi = 3.14$ "

(a)



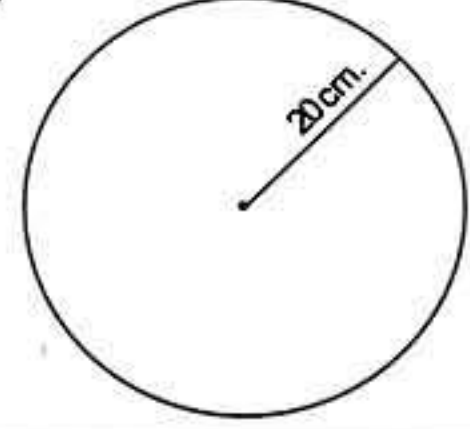
(b)



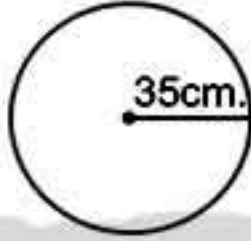
(c)



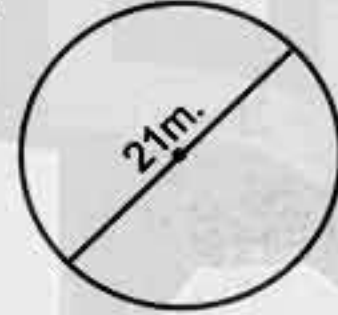
(d)

2 Find each circumference of the following : " $\pi = \frac{22}{7}$ "

(a)



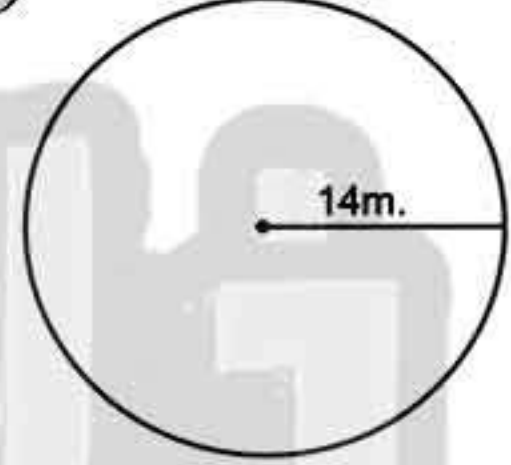
(b)



(c)



(d)



3 Find the circumference of the following circles whose radii lengths are :

" $\pi = \frac{22}{7}$ "

(a) 48 cm.

(b) 14 cm.

(c)  $10\frac{1}{2}$  cm.

(d) 3.5 cm.

4 Find the circumference of the following circles whose diameters lengths are :

" $\pi = 3.14$ "

(a) 10 cm.

(b) 100 cm.

(c) 50 cm.

5 Find the circumference of a circle whose diameter length is 15.4 cm. to the nearest hundredth. (where " $\pi = 3.14$ ")

6 Find the circumference of a circle with a radius of 42 cm. long to the nearest metre.

" $\pi = \frac{22}{7}$ "

7 Calculate the radius length of each of the following circles whose circumferences are :

(a) 88 cm.

( $\pi = \frac{22}{7}$ )

(b) 36.11 cm.

( $\pi = 3.14$ )



## Lesson Five

8 A circle is of circumference 66 cm. Find the length of its diameter. " $\pi = \frac{22}{7}$ "

9 If half the circumference of a circle equals 314 cm., find its diameter length in metres. " $\pi = 3.14$ "

10 Complete the table :

Radius length	Diameter length	$\pi$	Circumference
7 cm.	..... cm.	$\frac{22}{7}$	..... cm.
..... cm.	20 cm.	3.14	.....
..... cm.	..... cm.	3.14	75.36 cm.
..... mm.	98 mm.	$\frac{22}{7}$	..... mm.

11 Which is longer :

The circumference of the circle of radius length 7.7 cm. or the perimeter of the rectangle of dimensions 5.3 cm. and 4.8 cm. ? ( $\pi = \frac{22}{7}$ )

12 Find the difference between the circumferences of two circles whose two radii lengths are 14 cm. and 9.8 cm. ( $\pi = \frac{22}{7}$ )

13 Two circles in which the diameter length of the first one is 20 cm. and for the other one is 40 cm. Find the difference between their circumferences. ( $\pi = 3.14$ )

14 Complete :

- The diameter length =  $2 \times$  .....
- If the radius of a circle = 5 cm. long, then the length of the longest chord = ..... cm.
- If the length of the longest chord in a circle = 7 cm., then its circumference = ..... cm. where ( $\pi = \frac{22}{7}$ )
- If the radius length of a circle =  $x$  cm. , then its circumference equals ..... cm.
- If the circumference of a circle is  $10\pi$  cm., then its radius length is ..... cm.
- If half of the circumference of a circle is 157 cm., then its diameter length is ..... cm. ( $\pi = 3.14$ )

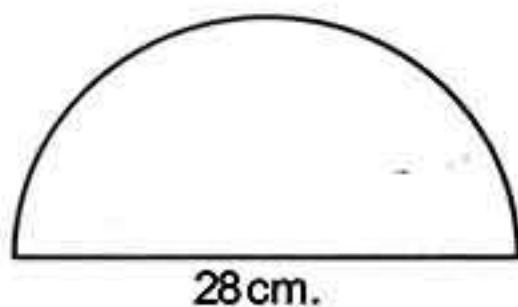
## Unit Three

15 Choose the correct answer from the given ones :

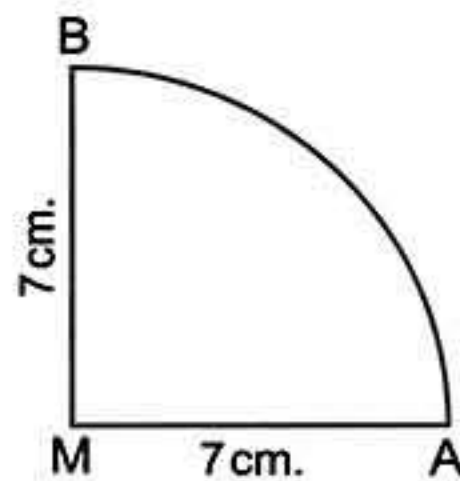
- (a) The circumference of a circle = .....  
(  $2\pi r$  or  $\pi r$  or  $4\pi r$  or  $2\pi d$  )
- (b) The circumference of the circle with diameter of length 7 cm.  
equals ..... cm. ( $\pi = \frac{22}{7}$ ) ( 22 or 44 or 66 or 88 )
- (c) The diameter length of the circle whose radius length 4 cm.  
equals ..... cm. ( 2 or 4 or 6 or 8 )
- (d) If the circumference of a circle is 44 cm. , then its diameter length  
is ..... cm. ( $\pi = \frac{22}{7}$ ) ( 28 or 14 or 7 or 9 )
- (e) The circumference of a circle  $\div r =$  .....  
(  $\pi$  or  $2\pi$  or  $\frac{\pi}{2}$  or  $\frac{1}{2}$  )
- (f) Twice the circumference of a circle with radius  $r$  cm. long = .....  
(  $\pi r$  or  $2\pi r$  or  $3\pi r$  or  $4\pi r$  )
- (g)  $\pi =$  .....  
(  $\frac{\text{circumference}}{r}$  or  $\frac{\text{circumference}}{2r}$   
or  $\frac{2 \text{ circumference}}{r}$  or  $\frac{\text{circumference}}{3r}$  )
- (h) If half the circumference of a circle is 25.12 cm., then the length of its  
radius = ..... cm. ( $\pi = 3.14$ ) ( 2 or 4 or 8 or 16 )
- (i) If the radius length of a circle is 20 cm., then its circumference  
= ..... cm. (  $10\pi$  or  $20\pi$  or  $40\pi$  or  $80\pi$  )

16 Calculate the perimeter of each of the following figures where. " $\pi = \frac{22}{7}$ "

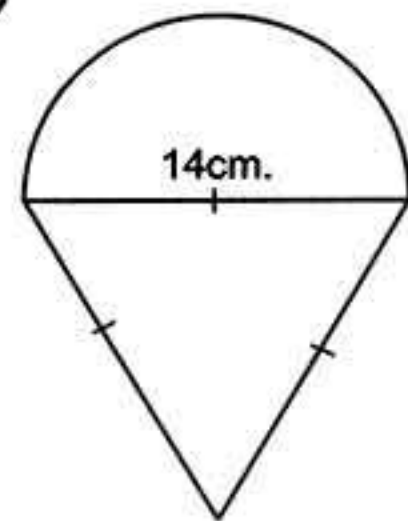
(a)



(b)



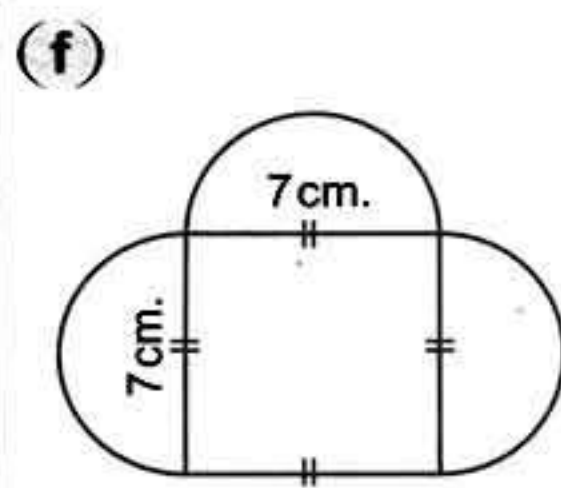
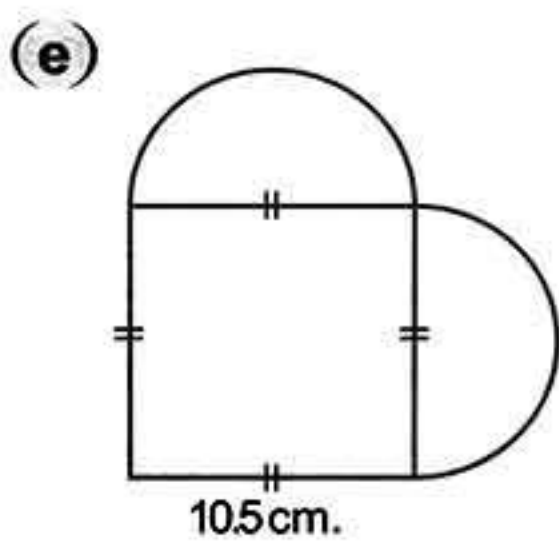
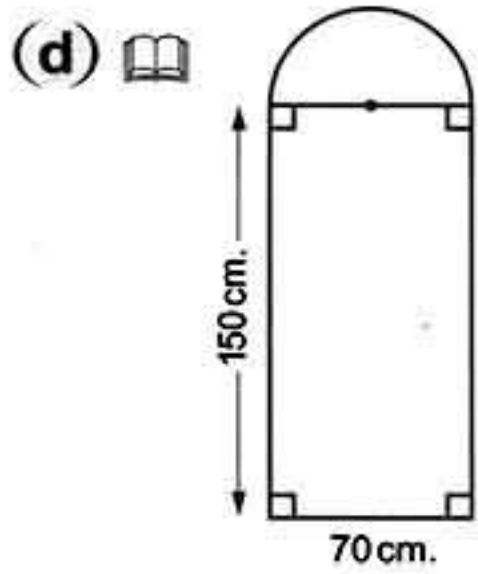
(c)



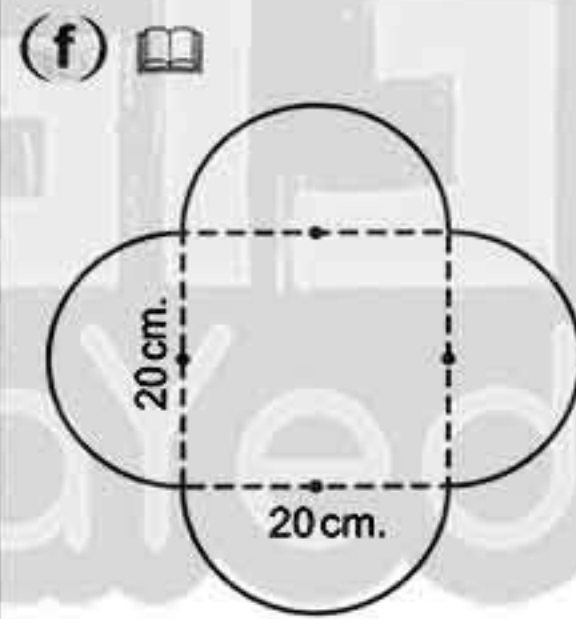
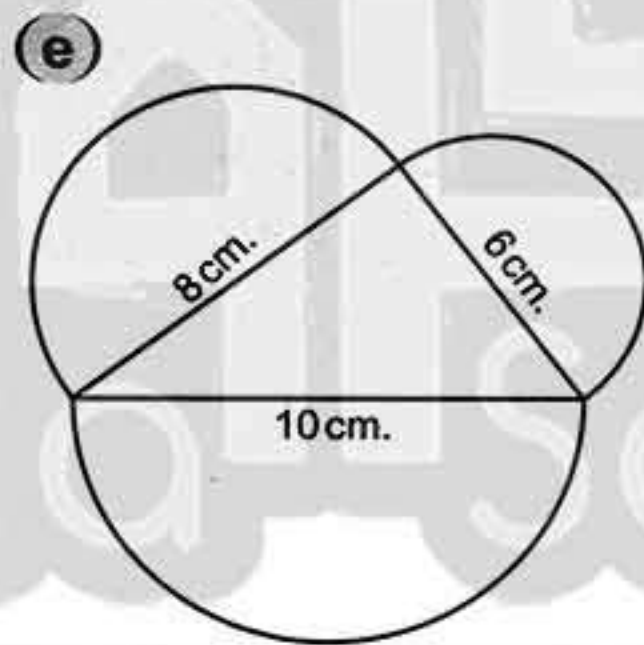
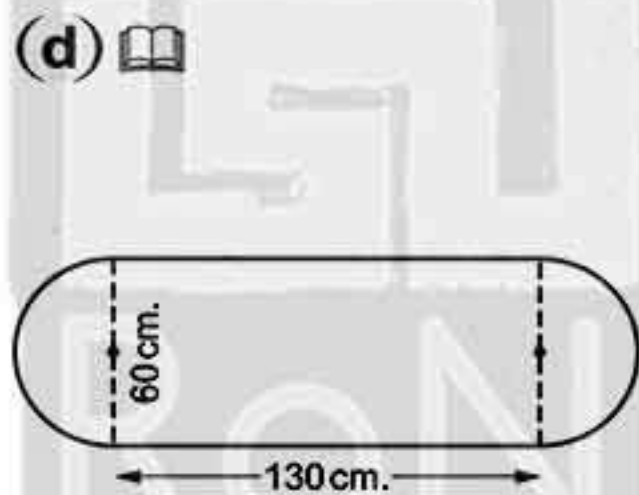
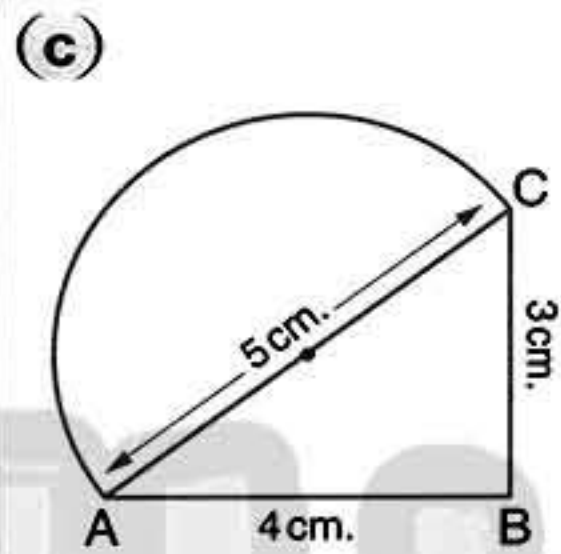
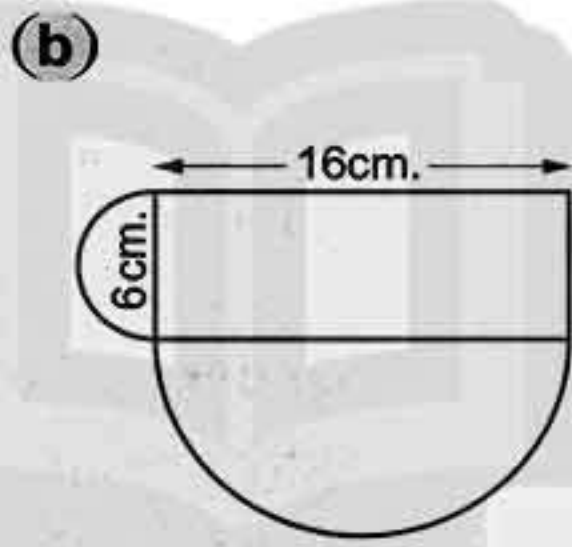
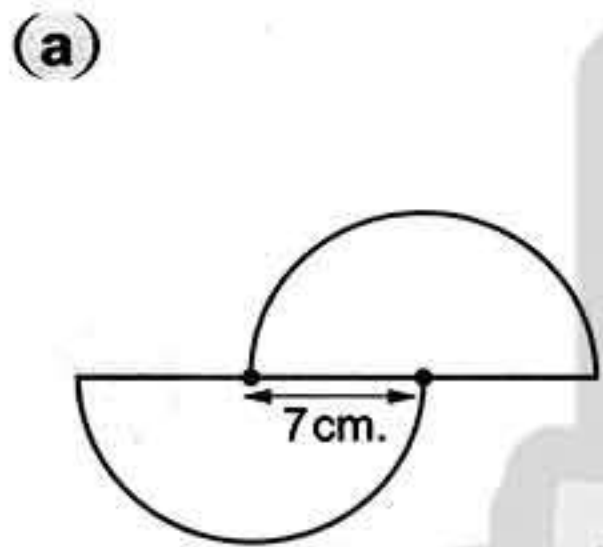




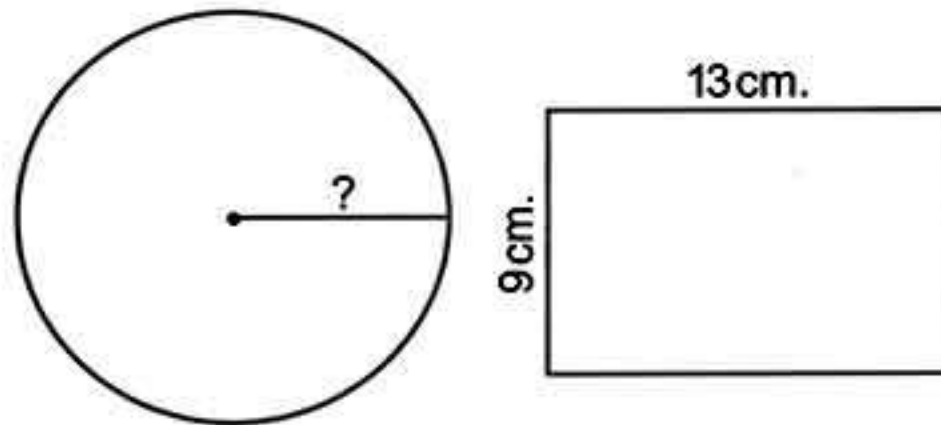
Lesson Five



17 Calculate the perimeter of each of the following figures where " $\pi = 3.14$ ":




18 Find the radius length of the circle, whose circumference is equal to the perimeter of a rectangle whose dimensions are 13 cm. and 9 cm. " $\pi = \frac{22}{7}$ "




19 If the perimeter of a square is twice the circumference of a circle, where the side length of the square is 22 cm., find the length of the diameter of the circle.

## Unit Three


- 20 If the circumference of a circle is 3 times the perimeter of a square , where the radius of the circle is 10.5 cm. long , find the side length of the square. " $\pi = \frac{22}{7}$ "

- 21  If the wheel's diameter length is 66 cm. What is the distance that the bike covers if the wheels turns 1000 rounds. ( $\pi = 3.14$ )




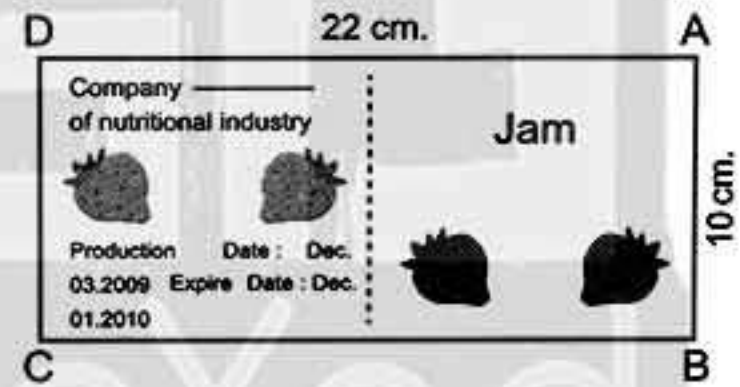
- 22  A wheel of a bicycle has a diameter length 56 cm. Find the covered distance when completing one turn. How many turns should be done to cover a distance of 352 m. ?



- 23  A jam jar has the form of a cylinder. Its flat base is a circle with diameter length 3.5 cm. Find the circumference of its flat base.

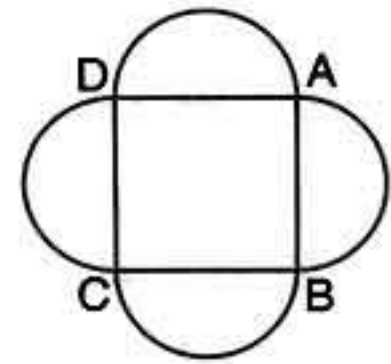


- 24  A piece of paper has the form of a rectangle with dimensions 10 cm. and 22 cm. is stuck down on the curved surface of the jam jar, where  $\overline{AB}$  coincides of  $\overline{DC}$ .



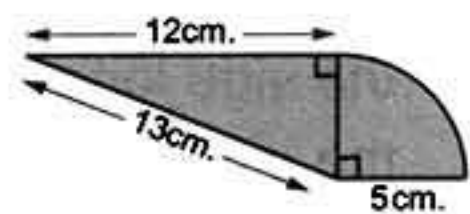
- (a) The height of the jam jar = ..... cm.  
 (b) The circumference of the flat base = ..... cm.  
 (c) Find the radius length of the flat base where " $\pi = \frac{22}{7}$ ".

- 25 The opposite figure represents a garden. If one metre of making a fence costs L.E. 75 , find the cost of making a fence around the garden given that ABCD is a square of side length 10.5 metres. " $\pi = \frac{22}{7}$ "



- 26 Complete :

- (a) The opposite figure is made up of a quarter of a circle surface and a triangle , then its perimeter equals ..... cm. ( $\pi = 3.14$ )





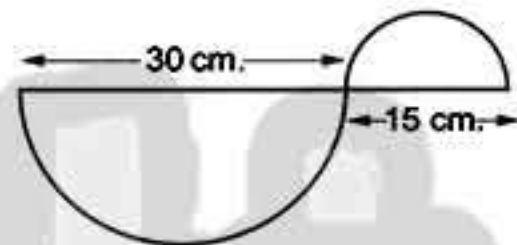
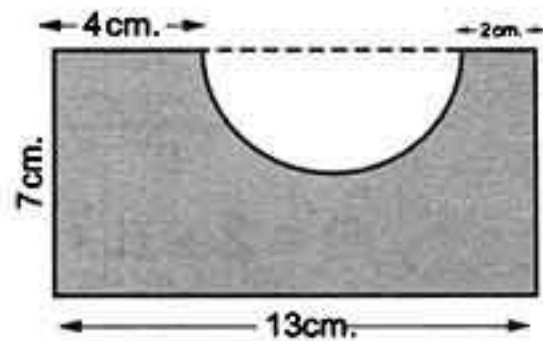
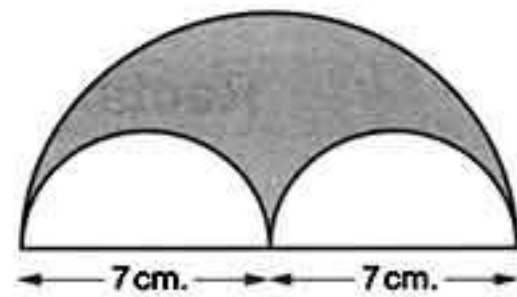
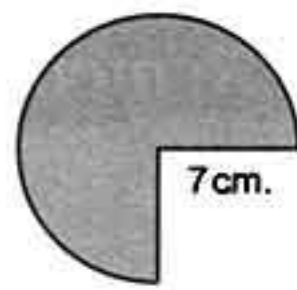
Lesson Five

(b) The perimeter of the opposite figure = ..... cm. " $\pi = \frac{22}{7}$ "

(c) The perimeter of the coloured part = ..... cm. " $\pi = \frac{22}{7}$ "

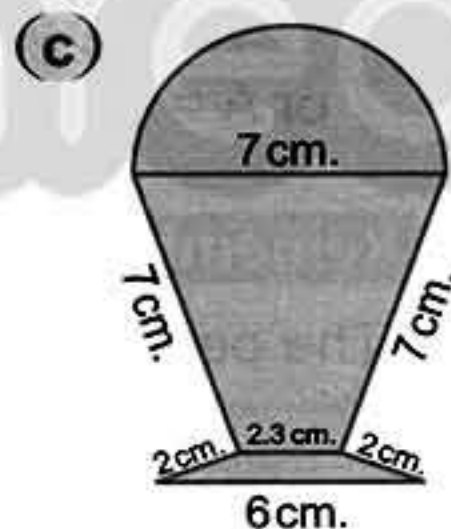
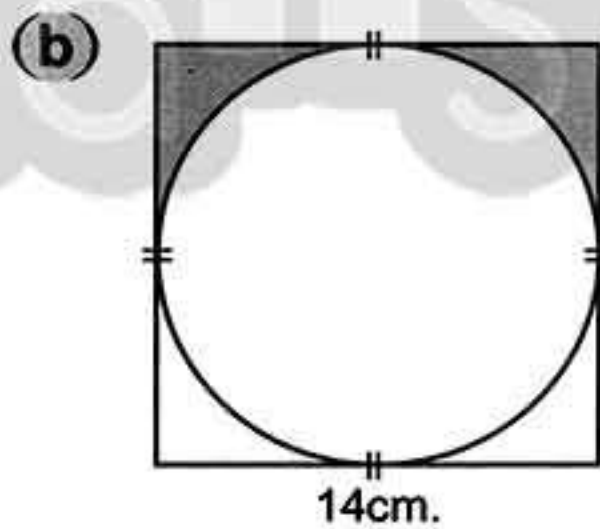
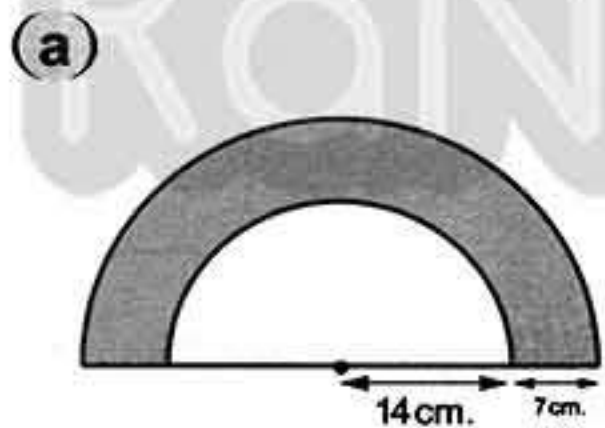
(d) The perimeter of the coloured part = ..... cm. " $\pi = \frac{22}{7}$ "

(e) A piece of wire is bent to form a shape as shown in the opposite figure, the total length of the piece of wire equals ..... cm. ( $\pi = 3.14$ )

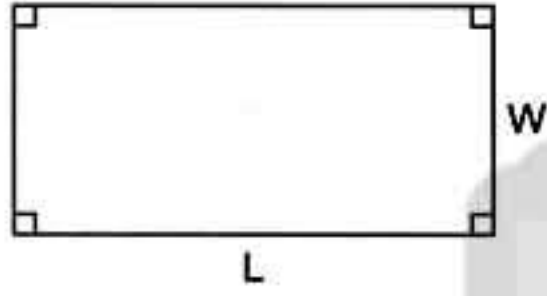


Challenge

27 In each of the following figures, find the perimeter of the coloured part " $\pi = \frac{22}{7}$ " :

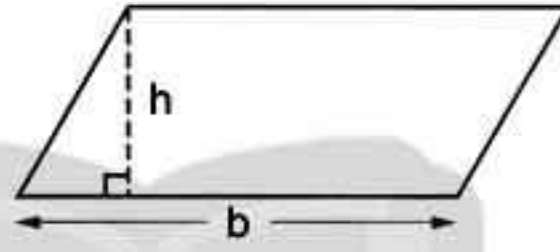


## Unit Three

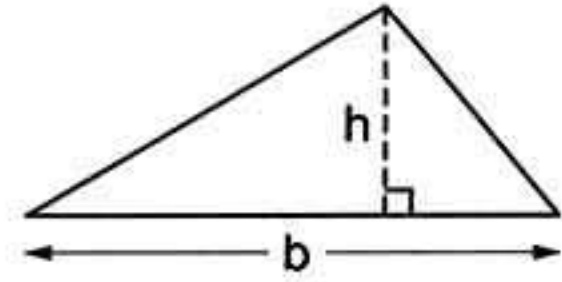
**Remember that :****Formulas for perimeter (P) and area (A)****(a) Rectangle**

$$P = 2 \times (L + W)$$

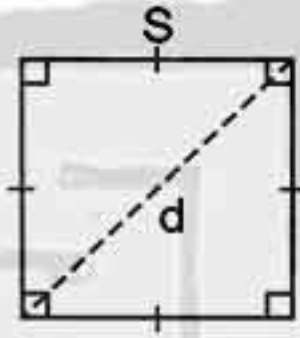
$$A = L \times W$$

**(b) Parallelogram**

$$A = b \times h$$

**(c) Triangle**

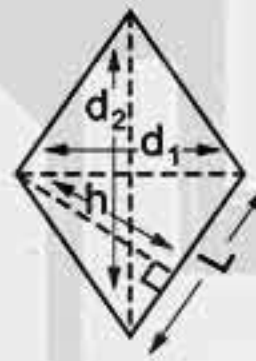
$$A = \frac{1}{2} \times b \times h$$

**(d) Square**

$$P = 4 \times S$$

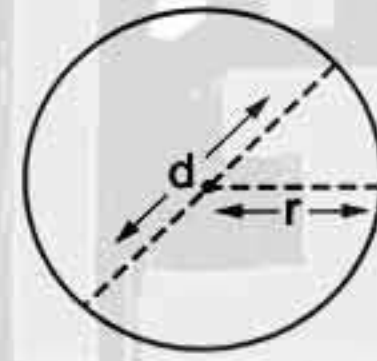
$$A = S \times S$$

$$\text{or } A = \frac{1}{2} \times d \times d$$

**(e) Rhombus**

$$A = L \times h$$

$$\text{or } A = \frac{1}{2} \times d_1 \times d_2$$

**(f) Circle**

$$C = 2 \times \pi \times r$$

$$\text{or } C = d \times \pi$$

**Remember that :**

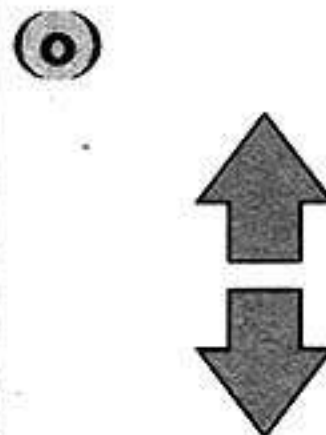
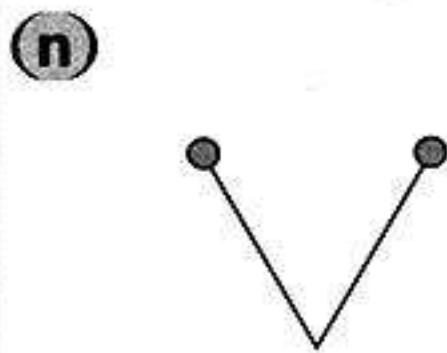
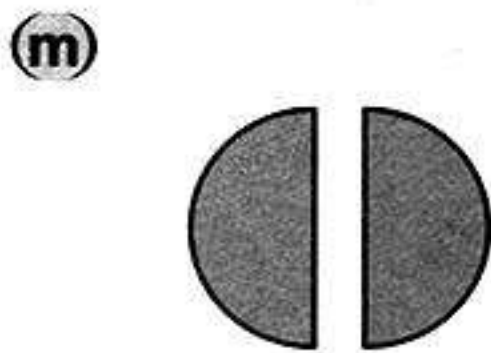
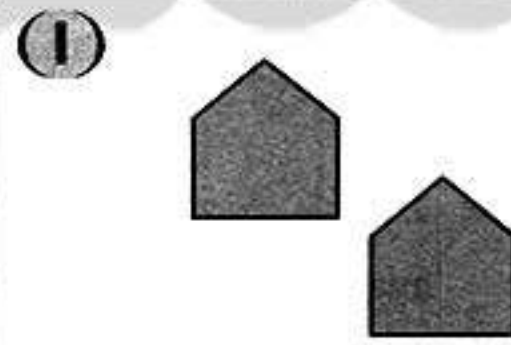
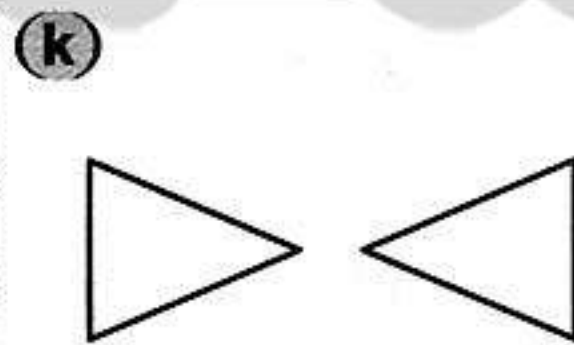
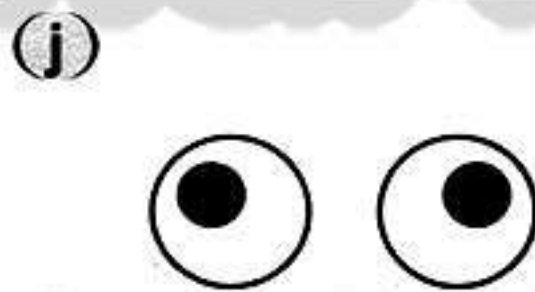
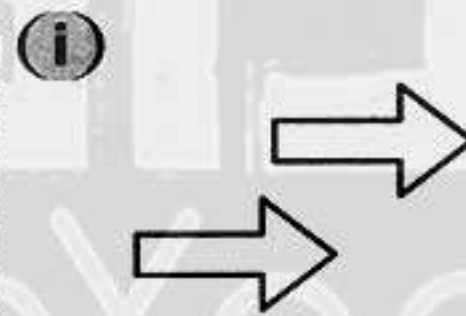
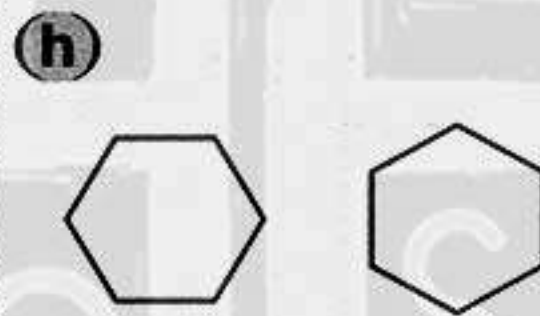
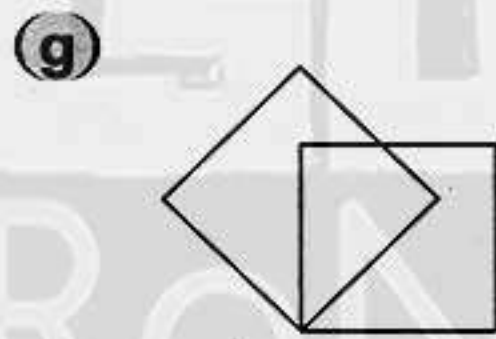
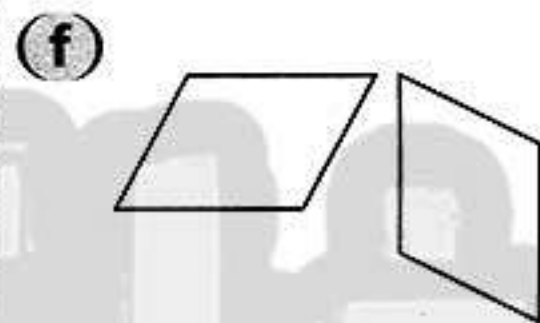
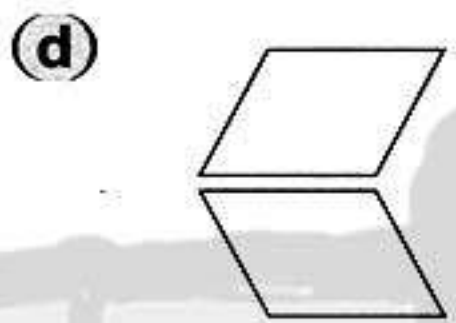
The perimeter of any polygon = the sum of lengths of its sides.



**Exercise 6** Geometric transformations - Symmetrical figures and axis of symmetry

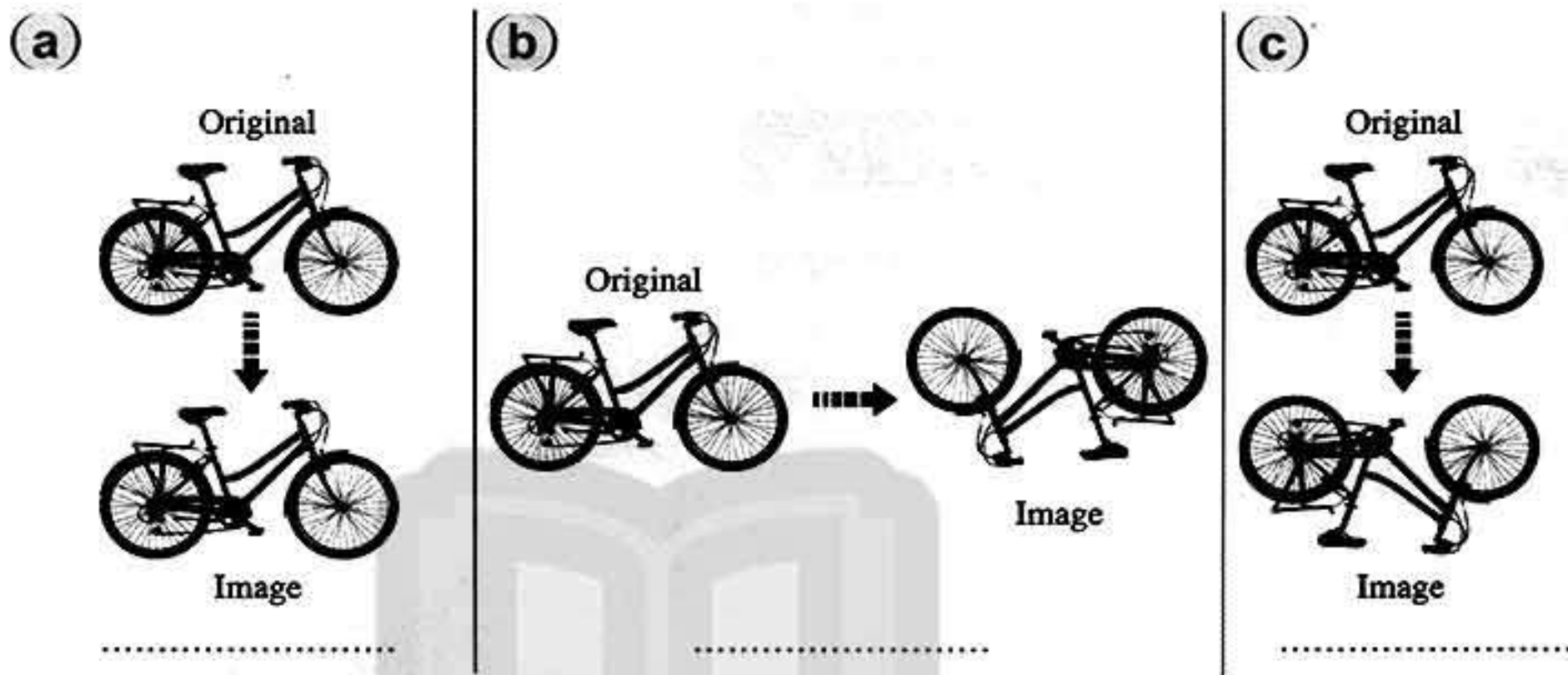
**Geometric transformations**

1 Describe the type of the geometric transformation (reflection, translation or rotation):

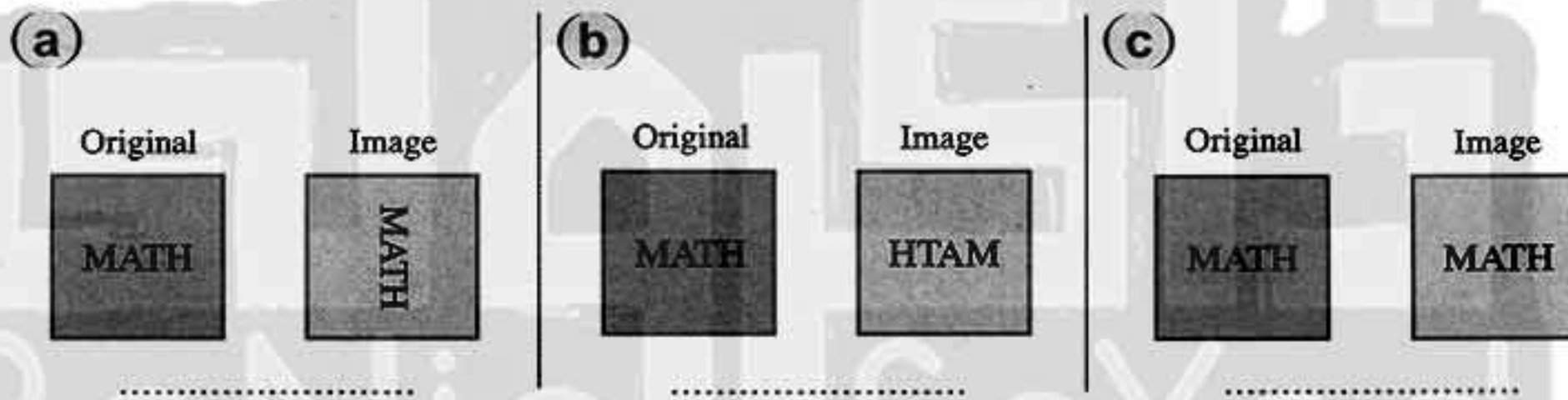


Unit Four

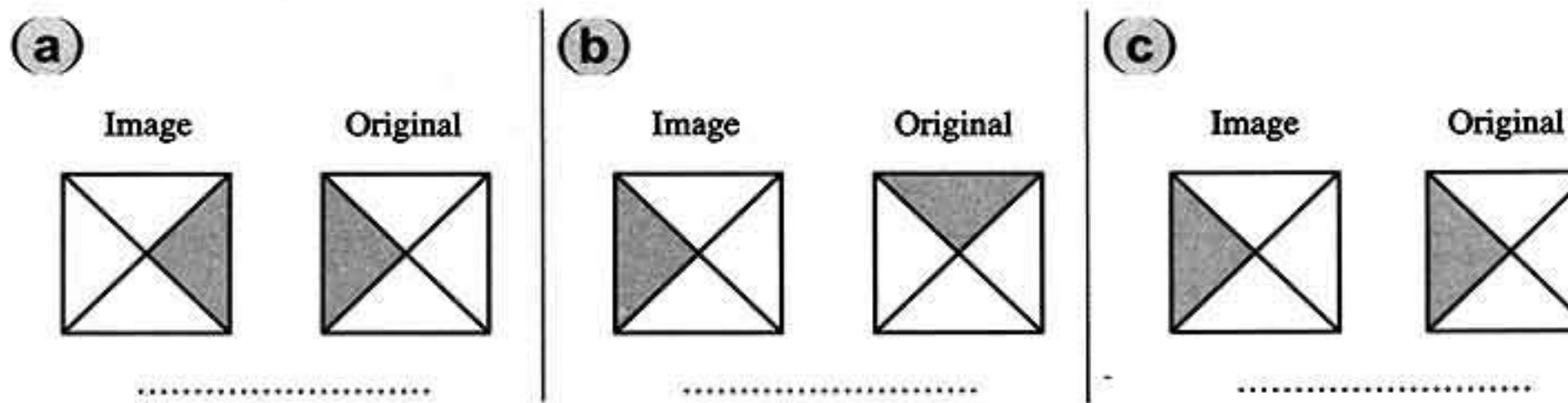
2 Describe the type of the geometric transformation (reflection, translation or rotation) in each of the following :



3 Write below each shape the type of the geometric transformation (reflection, translation or rotation) :



4 Write below each shape the type of the geometric transformation (reflection, translation or rotation) :





Lesson One

5 Write the type of the geometric transformation in each of the following shapes :

<p>(a)</p> <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p>Image</p> </div> <div style="text-align: center;"> <p>Original</p> </div> </div> <p>.....</p>	<p>(b)</p> <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p>Image</p> </div> <div style="text-align: center;"> <p>Original</p> </div> </div> <p>.....</p>	<p>(c)</p> <div style="display: flex; flex-direction: column; align-items: center;"> <div style="text-align: center;"> <p>Image</p> </div> <div style="margin: 10px 0;">Original</div> <div style="text-align: center;"> </div> </div> <p>.....</p>
---	---	---

6 Figure b is the image of figure a by a geometric transformation. Identify each transformation as (translation , reflection or rotation) :

<p>(a)</p> <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p>a</p> </div> <div style="text-align: center;"> <p>b</p> </div> </div> <p>.....</p>	<p>(b)</p> <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p>a</p> </div> <div style="text-align: center;"> <p>b</p> </div> </div> <p>.....</p>	<p>(c)</p> <div style="text-align: center;"> </div> <p>.....</p>
<p>(d)</p> <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p>b</p> </div> <div style="text-align: center;"> <p>a</p> </div> </div> <p>.....</p>	<p>(e)</p> <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p>b</p> </div> <div style="text-align: center;"> <p>a</p> </div> </div> <p>.....</p>	

7 Choose the correct answer :

- (a) Which of these techniques can transform the letter **b** into the letter **d** ?  
 ( Reflection or Rotation or Translation )
- (b) Which of these techniques can transform the letter **d** into the letter **p** ?  
 ( Reflection or Rotation or Translation )

## Unit Four

- (c) Which of these techniques can transform the letter **M** into the letter **W**?  
(Reflection or Rotation or Translation)
- (d) Which of these techniques can transform the letter **Z** into the letter **N**?  
(Reflection or Rotation or Translation)

## Symmetrical figures and axis of symmetry

8 In each of the following, if the figure is symmetrical, then draw all the axis of symmetry to it :

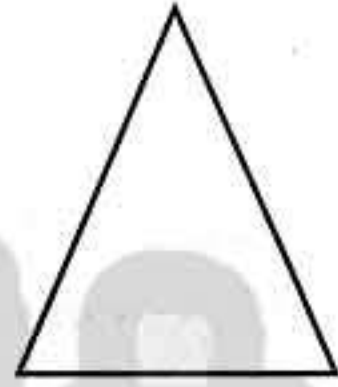
(a)



(b)



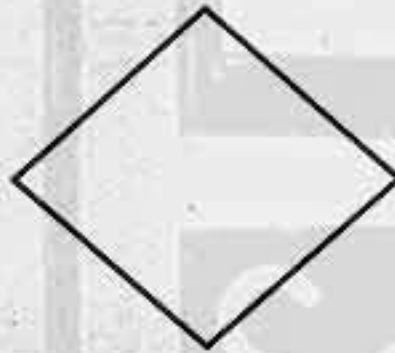
(c)



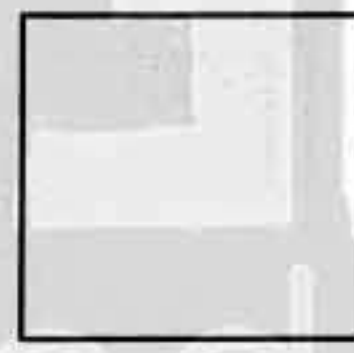
(d)



(e)



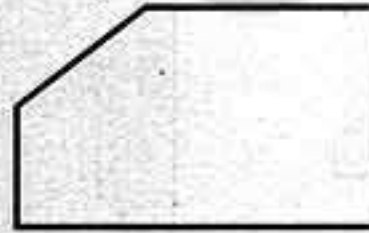
(f)



(g)



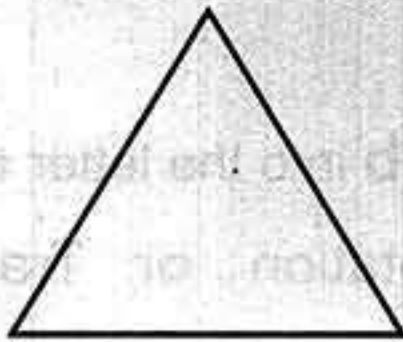
(h)



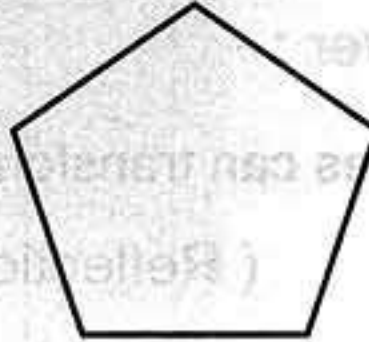
(i)



(j)



(k)



(l)

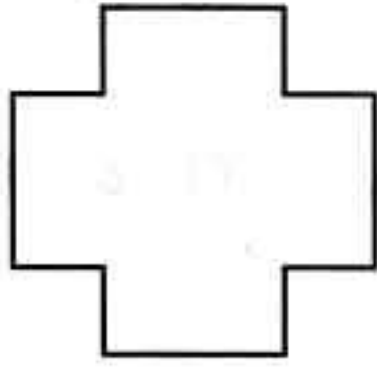




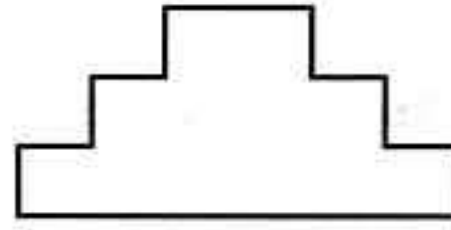


## Lesson One

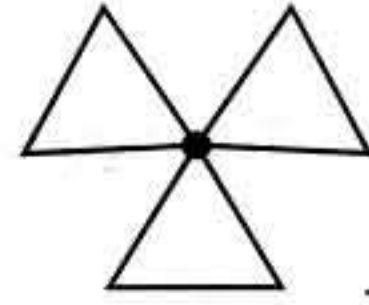
(m)



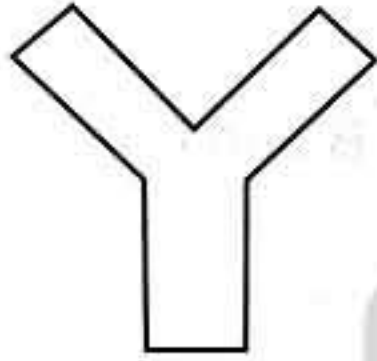
(n)



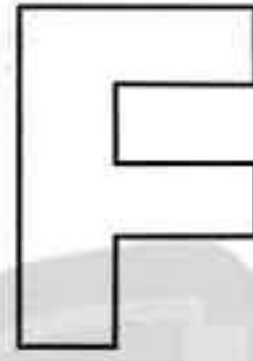
(o)



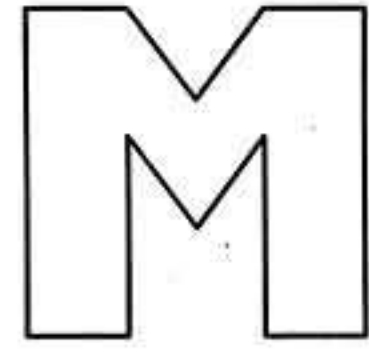
(p)



(q)



(r)



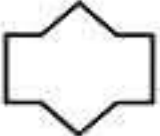
## 9 Complete the following :

- The symmetry axis divides the figure into two ..... halves.
- The isosceles triangle has ..... axis of symmetry.
- The equilateral triangle has ..... axes of symmetry.
- The isosceles trapezium has ..... axes of symmetry.
- The square has ..... axes of symmetry.
- The rectangle has ..... axes of symmetry.
- The rhombus has ..... axes of symmetry.
- The regular hexagon has ..... axes of symmetry.
- A diagonal of the rectangle divides it into two ..... triangles, but it is not ..... for the rectangle.

## 10 Choose the correct answer :

- The scalene triangle has ..... axes of symmetry. (2 or 0 or 1)
- The parallelogram has ..... axes of symmetry. (4 or 2 or 0)
- Which of these figures has the greater number of axes of symmetry? .....  
(square or equilateral triangle or rectangle)
- The regular pentagon has ..... axes of symmetry. (0 or 1 or 5)

## Unit Four

(e) This figure  has ..... axes of symmetry. (4 or 1 or 2)

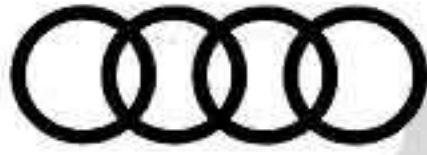
(f) This figure  has ..... axes of symmetry. (1 or 0 or 2)

(g) In the opposite letters : **K X B F**

which ones have only one axis of symmetry ?

(K and X or B and F or K and B)

**11** In our daily life , we see many figures having one or more axes of symmetry in front of you , there are some signs of cars. Draw their axes of symmetry if they exist :



(a)



(b)



(c)



(d)



(e)



(f)



(g)

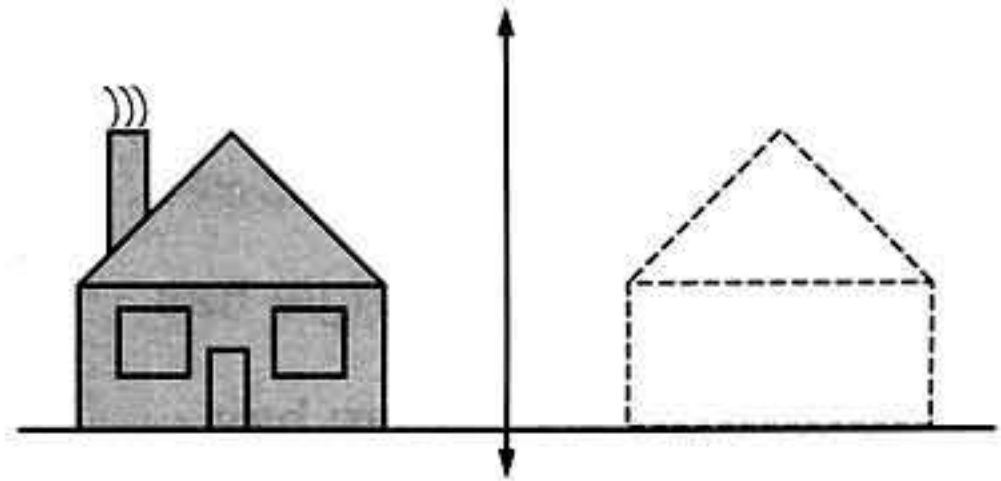


(h)



## Challenge

**12** Draw the flip image around the blue line in the following shape :



## Unit Four

From the school book

## Exercise

## 7

## Reflection

1 In the following grid , observe and answer :

(a) Tell what point is located at each ordered pair :

(1)  $(0, 8)$  .....

(2)  $(9, 6)$  .....

(3)  $(6, 0)$  .....

(4)  $(2, 3)$  .....

(5)  $(1, 0)$  .....

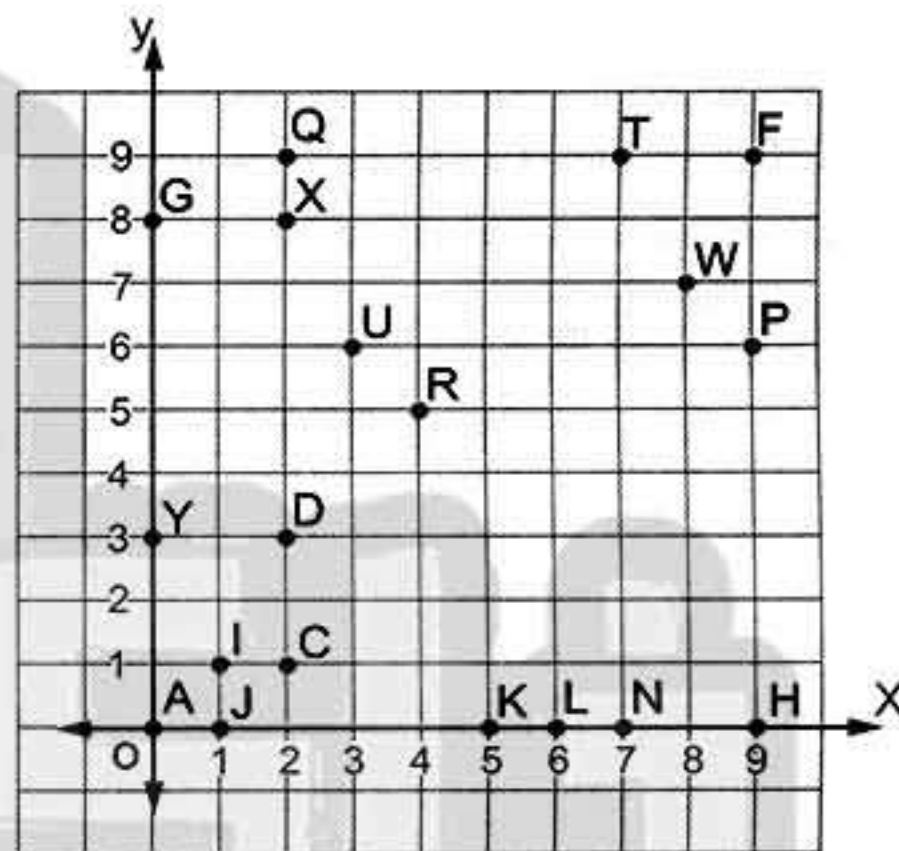
(6)  $(7, 9)$  .....

(7)  $(4, 5)$  .....

(8)  $(2, 9)$  .....

(9)  $(9, 0)$  .....

(10)  $(0, 0)$  .....



(b) Write the ordered pair of each of the following points :

(1) W .....

(2) Y .....

(3) N .....

(4) F .....

(5) C .....

(6) X .....

(7) K .....

(8) U .....

(9) I .....

(c) Plot the following points on the coordinates grid :

(1) E  $(7, 5)$

(2) M  $(1, 5)$

(3) Z  $(8, 2)$

(4) B  $(9, 3)$

(5) V  $(8, 9)$

(6) S  $(5, 8)$



## Lesson Two

2 In the opposite figure :

(a) Complete :

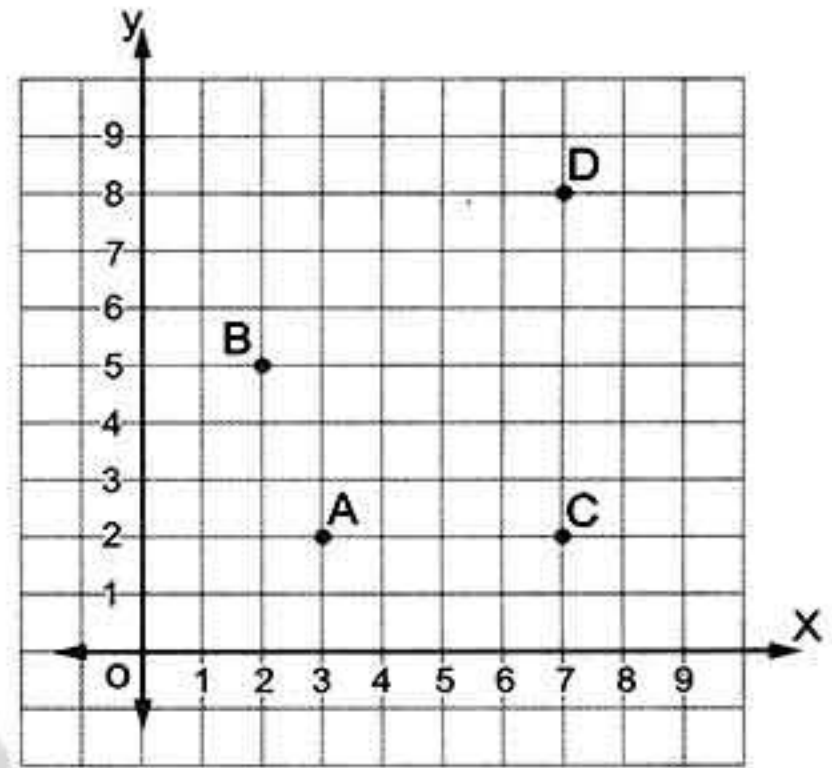
(1) Point C ( ..... , ..... ) and  
point D ( ..... , ..... )

(2) AC = ..... units and  
CD = ..... units.

(b) On the figure , plot the points  
M ( 5 , 2 ) and N ( 5 , 8 ) , then  
complete :

CM = ..... units. , MN = ..... units. , ND = ..... units.

The name of the figure MNDC is ..... and the perimeter of the figure  
MNDC is ..... units.



3 In the opposite coordinate plane :

(a) Graph the figure ABCD where :

A = ( 2 , 8 ) , B = ( 3 , 4 ) , C = ( 8 , 4 )  
and D = ( 7 , 8 )

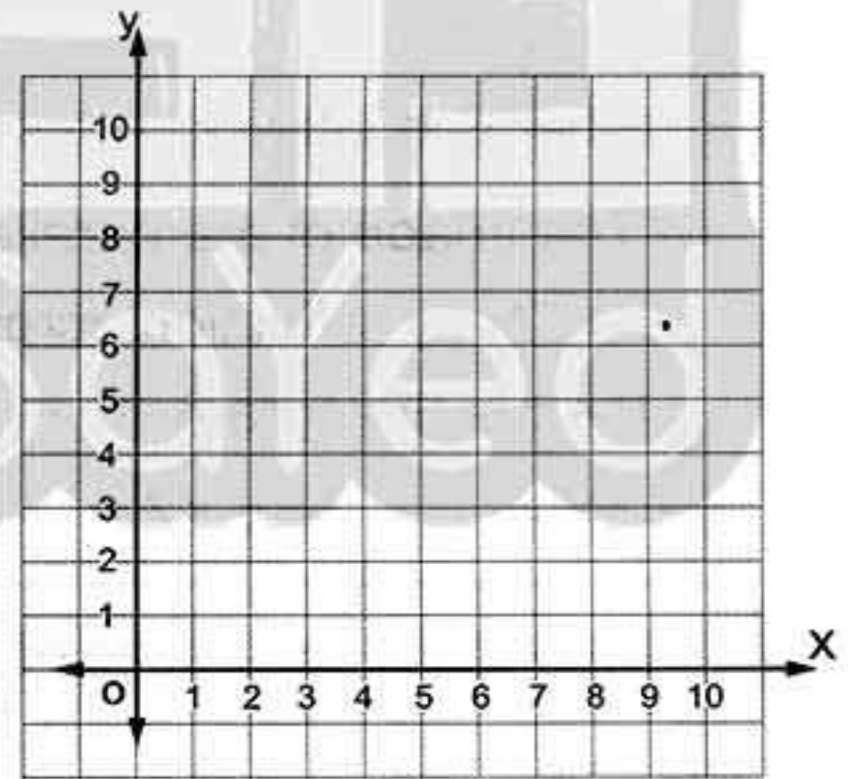
(b) What is the name of the figure  
ABCD ?

(c) Use the geometric instruments  
to find the coordinates of the  
intersection of the two straight lines  
 $\overrightarrow{AC}$  and  $\overrightarrow{BD}$ .

(d) What are the coordinates of the midpoint to the line segment  $\overline{AC}$  ?

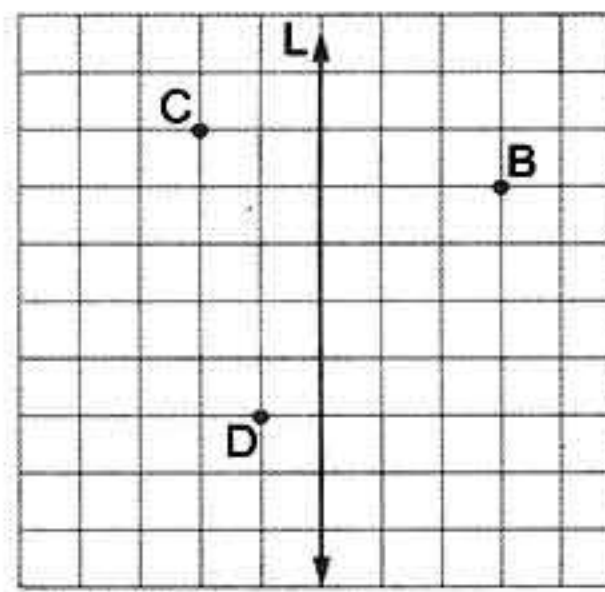
(e) What is the length of  $\overline{AD}$  ?

(f) What is the area of the figure ABCD ?

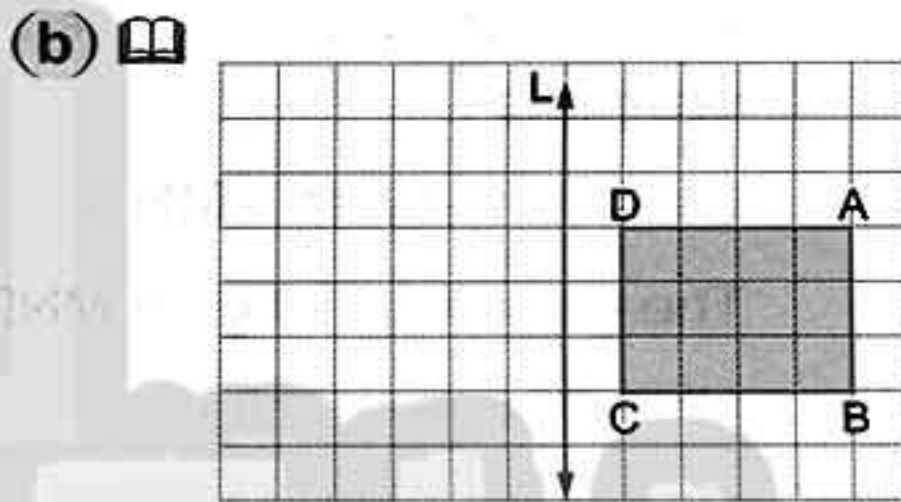
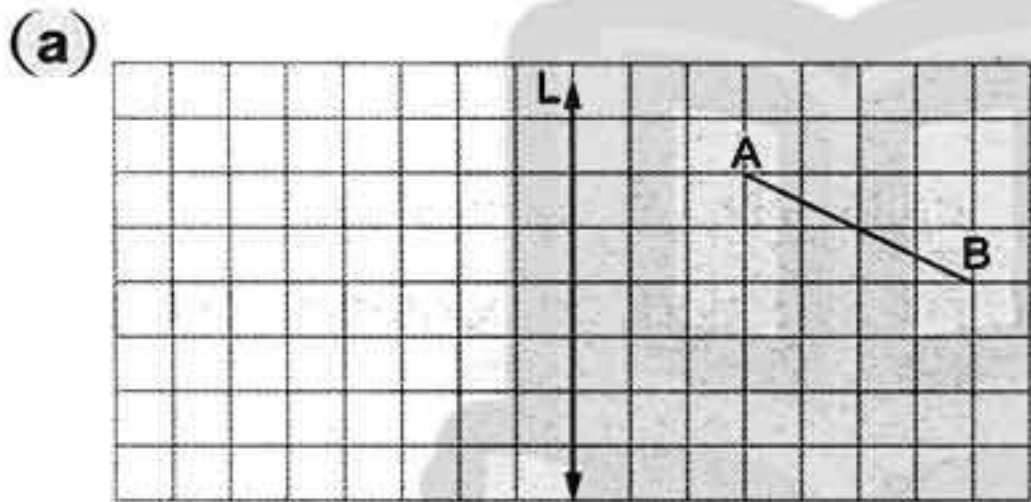


Unit Four

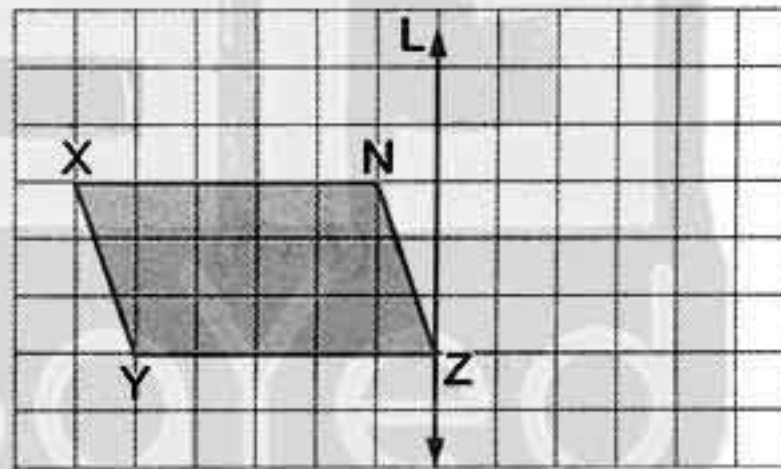
4 In the opposite figure :  
Find the image of points B , C and D by reflection across L.



5 In each of the following , find the image of the figure by reflection across L :

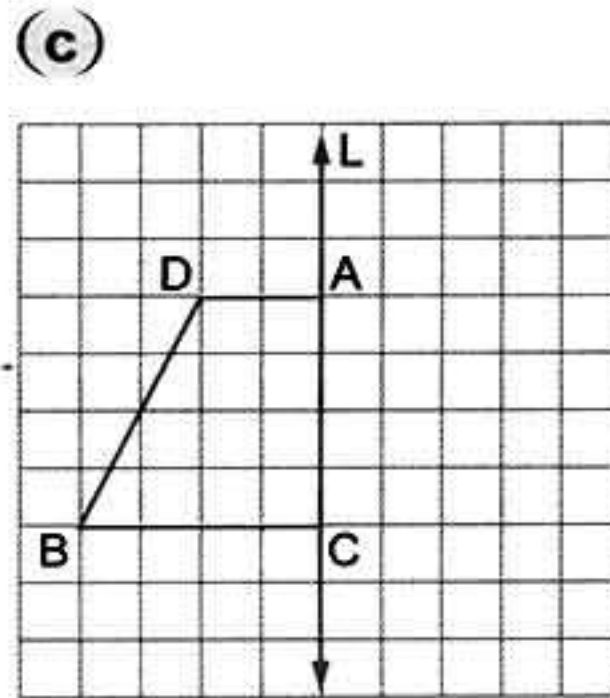
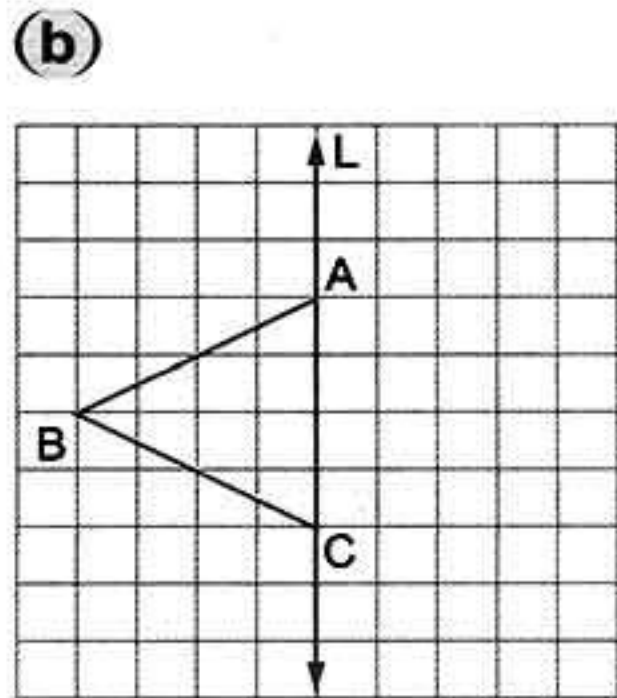
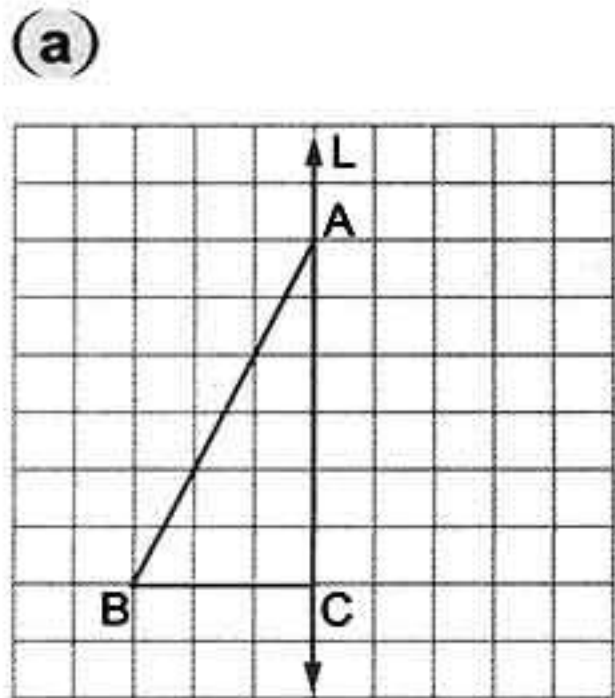


6 In the opposite figure :  
Find the image of the parallelogram XYZN by reflection across L , then complete :



- (a) The image of the parallelogram XYZN by reflection across L is the parallelogram .....
- (b)  $XY = \dots\dots\dots$  and  $YZ = \dots\dots\dots$

7 Determine the image of each figure by reflection across L :





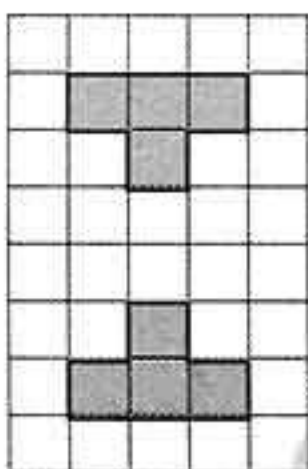
## Lesson Two

Refer to the previous figures , complete :

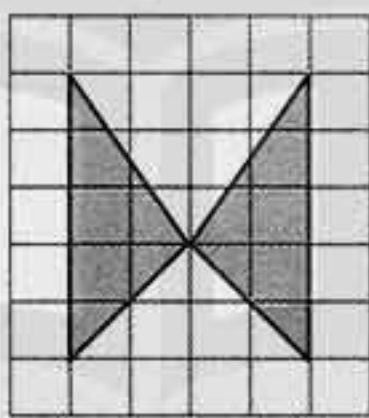
- (1) Each figure and its image are .....
- (2) The image of point A is ..... because it .....
- (3) The image of point C is ..... because it .....
- (4) If the paper - where the figure is drawn on - is folded along the axis of symmetry the figure coincides on .....

**8** Draw the axis of symmetry to make one of the following figures an image to the other :

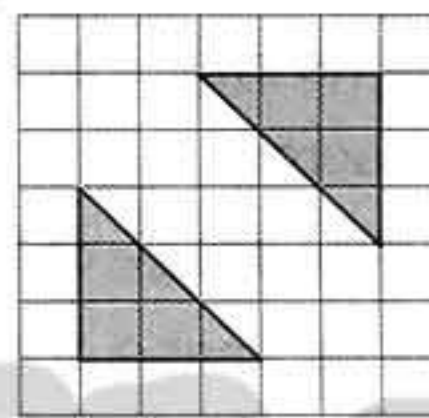
(a)



(b)

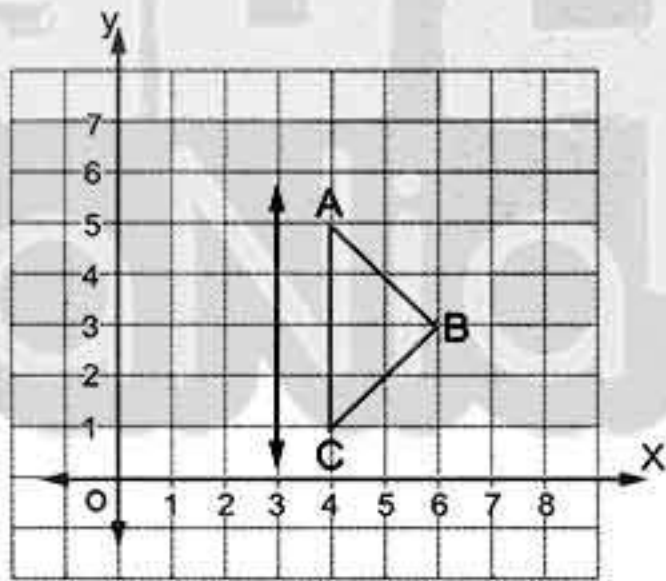


(c)

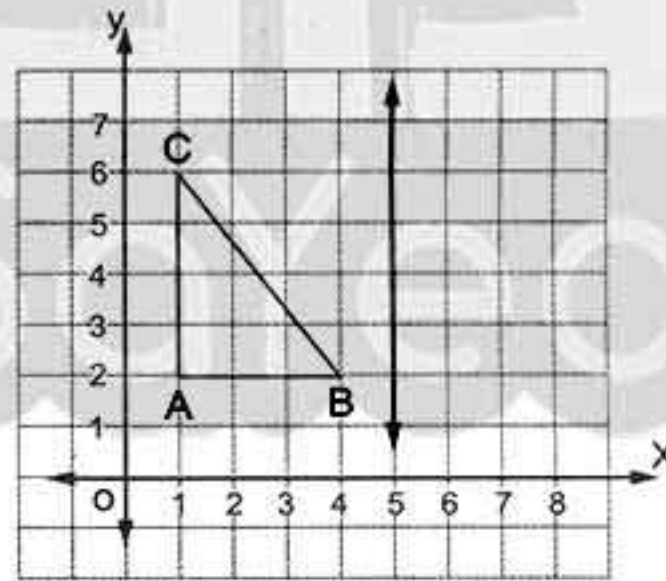


**9** In each of the following , draw a triangle which is a reflection image of the given triangle across the black line :

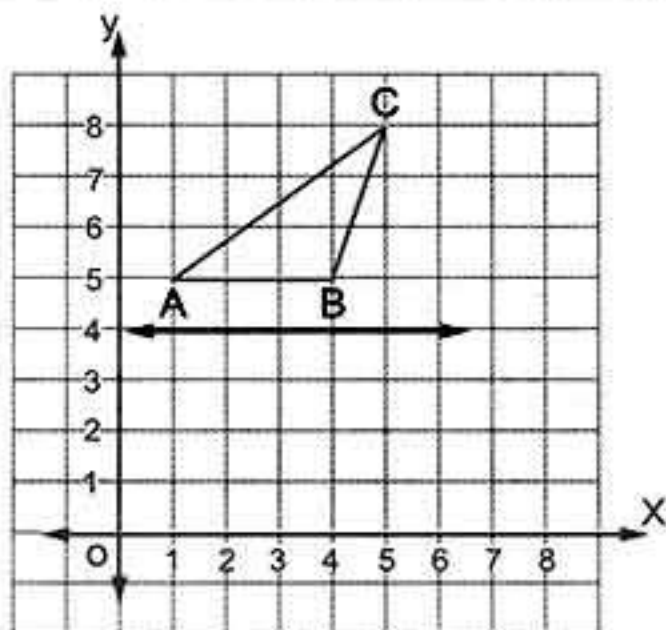
(a)



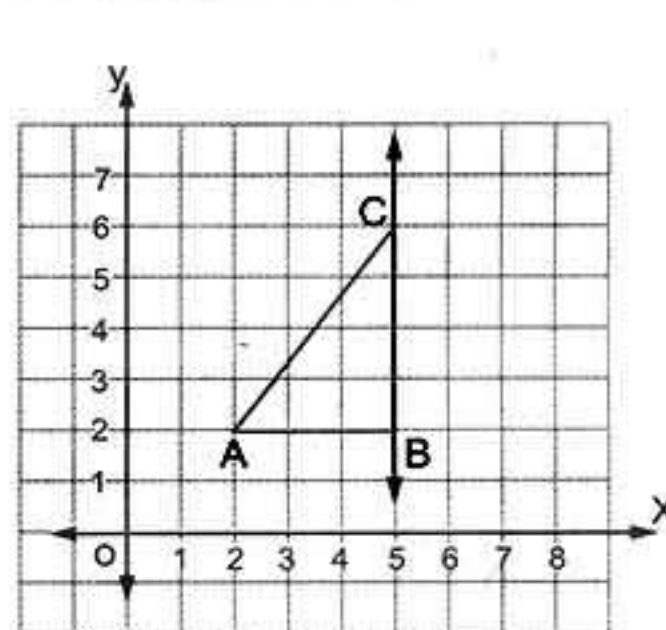
(b)



(c)



(d)



## Unit Four

10 On the coordinate plane illustrated in the opposite figure :

(a) Complete :

A ( ..... , ..... )

B ( ..... , ..... )

C ( ..... , ..... )

D ( ..... , ..... )

(b) If L is the axis of reflection to the figure ABCD , Complete :

(1) The image of B by reflection across L is  $\hat{B}$  ( ..... , ..... )

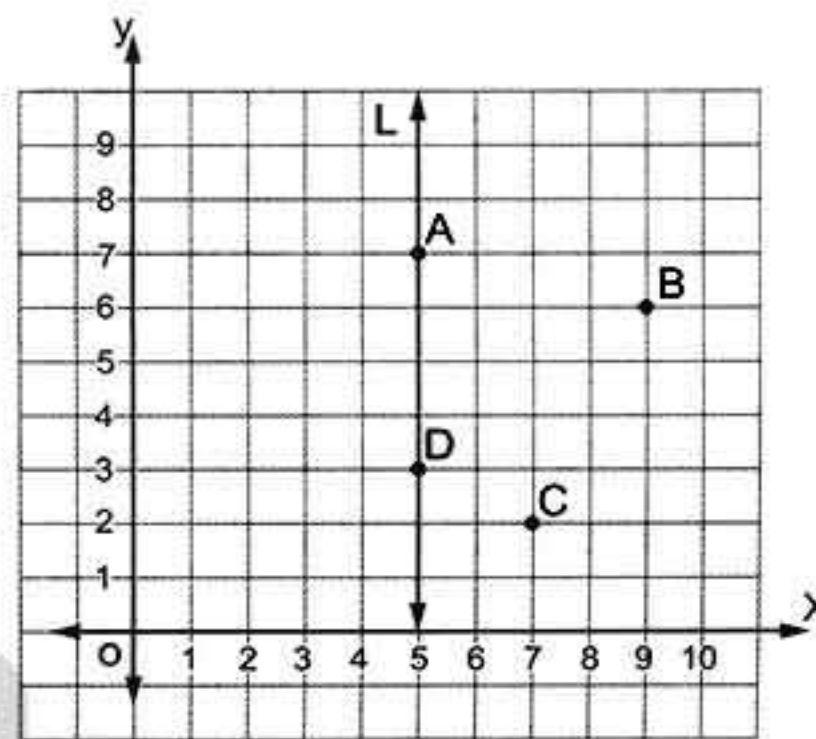
(2) The image of C by reflection across L is  $\hat{C}$  ( ..... , ..... )

(3) The image of A by reflection across L is  $\hat{A}$  ( ..... , ..... )

(4) The image of D by reflection across L is  $\hat{D}$  ( ..... , ..... )

(5) The image of  $\Delta BCD$  by reflection across L is .....

(6) The image of the figure ABCD by reflection across L is .....



11 On a coordinate plane :

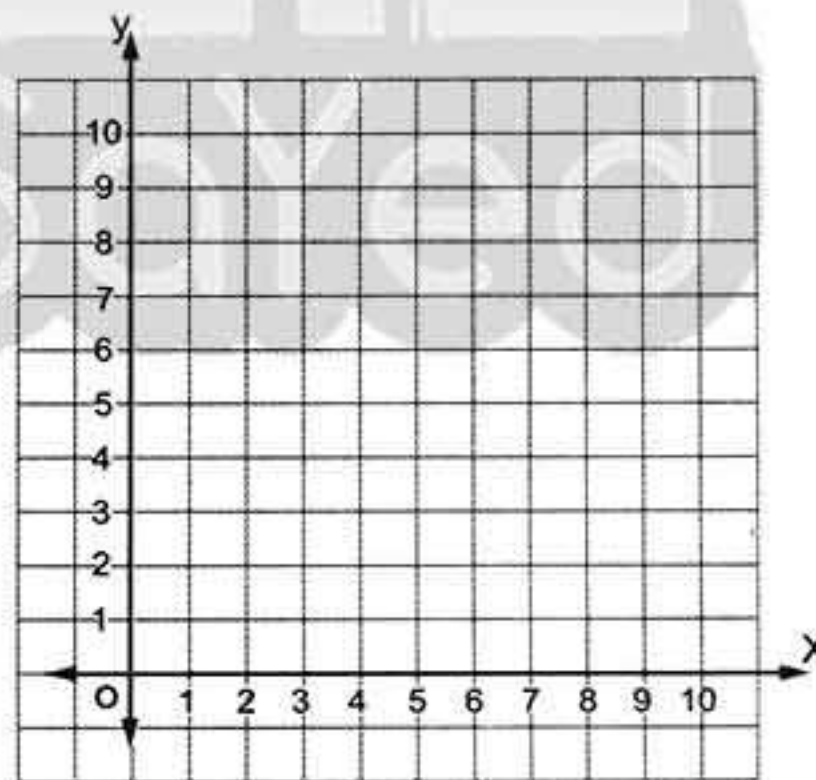
(a) Plot the following points :

A (3 , 5) , B (6 , 5) and C (3 , 2).

(b) Find the length of  $\overline{AC}$ .

(c) Find the length of  $\overline{AB}$ .

(d) Draw the image of  $\Delta ABC$  by reflection across  $\overline{AC}$  and determine the ordered pairs that represent the vertices of the image.



12 On the coordinate plane : Draw the triangle ABC , where A (3 , 1) , B (3 , 5) and C (1 , 1) , then draw the image of  $\Delta ABC$  by reflection across  $\overline{AB}$ .

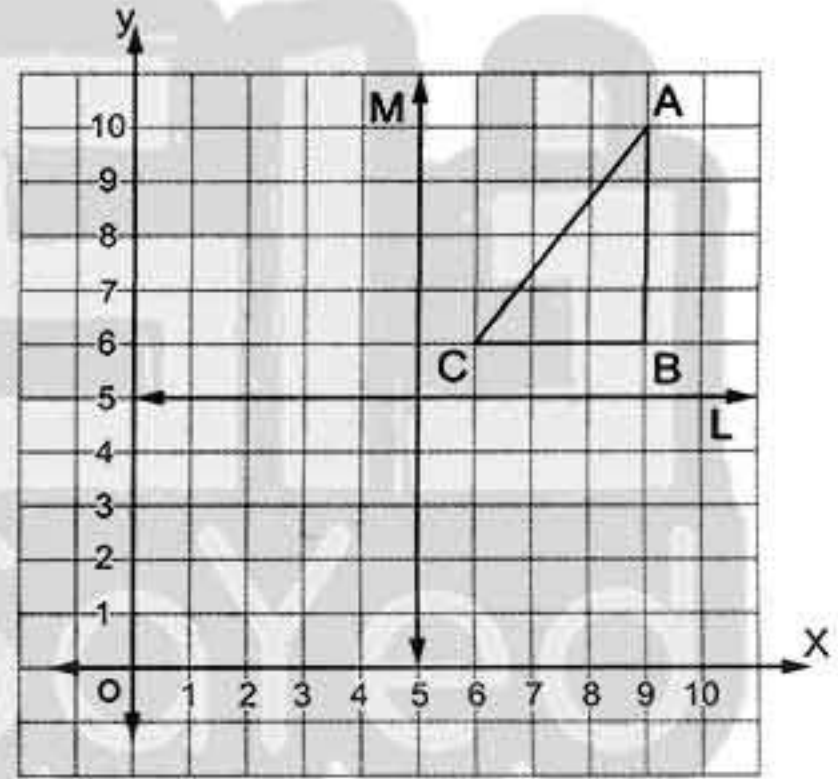


## Lesson Two

- 13** On the coordinate plane : Draw the triangle ABC , where A (1 , 2) , B (1 , 5) and C (5 , 5) , then draw the image of triangle ABC by reflection across  $\overleftrightarrow{BC}$ .
- 14** On the coordinate plane : Draw the triangle ABC , where A (4 , 5) , B (2 , 0) and C (4 , 1) , then draw its image by reflection across  $\overleftrightarrow{AC}$ .
- 15** On the coordinate plane : Draw the figure ABCD in which A (2 , 3) , B (2 , 5) , C (5 , 5) and D (5 , 2) , then draw its image by reflection across  $\overleftrightarrow{CD}$ .
- 16** On the coordinate plane , determine the points : A (5 , 0) , B (9 , 0) , C (9 , 4) and D (5 , 4). What is the name of the figure ABCD ? Then find its image by reflection across  $\overleftrightarrow{AD}$ .

**17** The opposite figure represents a coordinate plane :

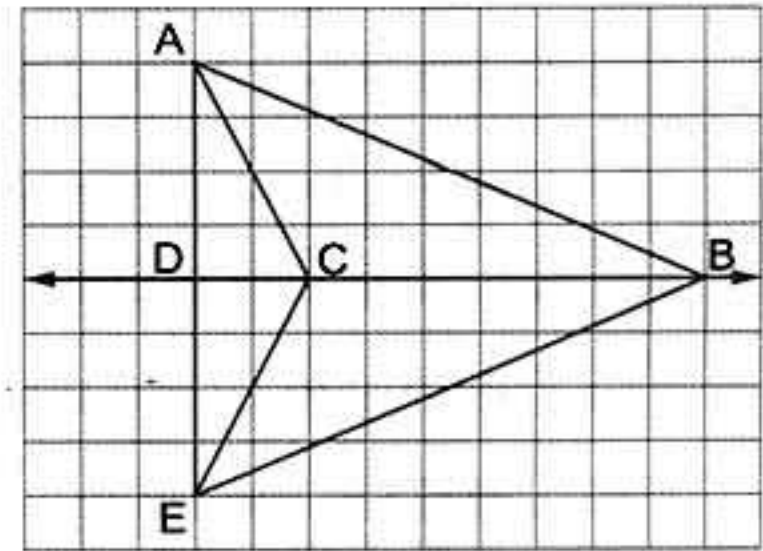
- (a) Write the coordinates of points A , B and C.
- (b) Draw  $\triangle \hat{A} \hat{B} \hat{C}$  the image of  $\triangle ABC$  by reflection across (L) and determine the coordinates of the vertices  $\hat{A}$  ,  $\hat{B}$  and  $\hat{C}$ .
- (c) Draw  $\triangle \check{A} \check{B} \check{C}$  the image of  $\triangle ABC$  by reflection across (M) and determine the coordinates of its vertices  $\check{A}$  ,  $\check{B}$  and  $\check{C}$ .



**18** In the opposite figure ,  $\overleftrightarrow{BD}$  is the axis of reflection.

Complete :

- (a) The image of  $\triangle ABC$  by reflection across  $\overleftrightarrow{BD}$  is ..... , then  $AB = \dots\dots\dots$  and  $AC = \dots\dots\dots$
- (b) The image of  $\triangle ACD$  by reflection across  $\overleftrightarrow{BD}$  is ..... , then  $AD = \dots\dots\dots$  and  $\overline{CD}$  coincides on .....
- (c)  $\triangle ABC$  is congruent to  $\triangle \dots\dots\dots$  and  $\triangle ECD$  is congruent to  $\triangle \dots\dots\dots$

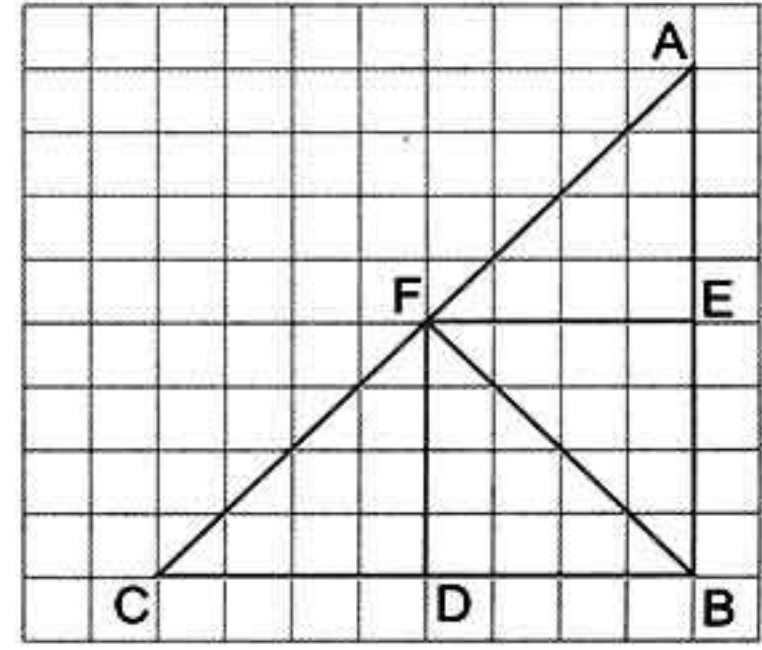




## Unit Four

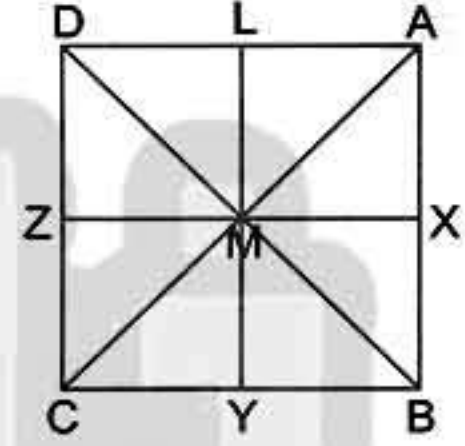
19 In the opposite figure , Complete :

- (a)  $\triangle BEF$  is the image of  $\triangle AEF$   
by reflection across .....
- (b)  $\triangle BDF$  is the image of  $\triangle CDF$   
by reflection across .....
- (c)  $\triangle ABF$  is the image of  $\triangle CBF$   
by reflection across .....
- (d)  $\triangle BEF$  is the image of  $\triangle BDF$   
by reflection across .....



20 In the opposite figure :

ABCD is a square. M is the point of intersection of its diagonals X , Y , Z and L are the midpoints of its sides  $\overline{AB}$  ,  $\overline{BC}$  ,  $\overline{CD}$  and  $\overline{DA}$  respectively.



Complete the following :

- (a) The image of the point A by reflection across  $\overleftrightarrow{LY}$  is .....
- (b) The image of the  $\overline{AM}$  by reflection across  $\overleftrightarrow{XM}$  is .....
- (c) The image of the  $\triangle ALM$  by reflection across  $\overleftrightarrow{LY}$  is .....
- (d) The image of the  $\triangle ALM$  by reflection across  $\overleftrightarrow{XZ}$  is .....
- (e) The image of the  $\triangle ALM$  by reflection across  $\overleftrightarrow{AM}$  is .....
- (f) The image of the  $\triangle AMB$  by reflection across  $\overleftrightarrow{LY}$  is .....
- (g) The image of the  $\triangle AMB$  by reflection across  $\overleftrightarrow{XZ}$  is .....
- (h) The image of the square AXML by reflection across  $\overleftrightarrow{LY}$  is ..... and  
by reflection across  $\overleftrightarrow{AM}$  is .....
- (i) The image of the square ABCD by reflection across  $\overleftrightarrow{LY}$  is .....
- (j)  $\triangle MZD$  is the image of  $\triangle MZC$  by reflection across .....
- (k)  $\triangle AXM$  is the image of  $\triangle CYM$  by reflection across .....

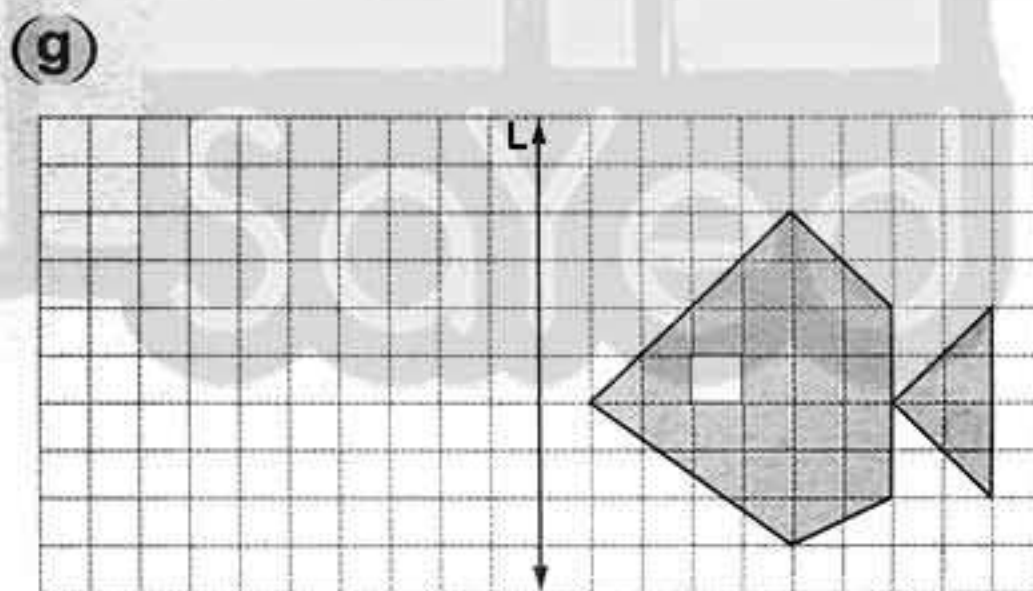
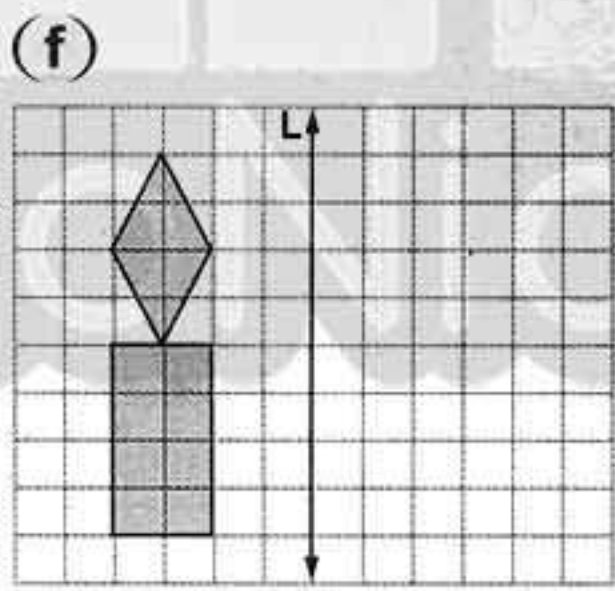
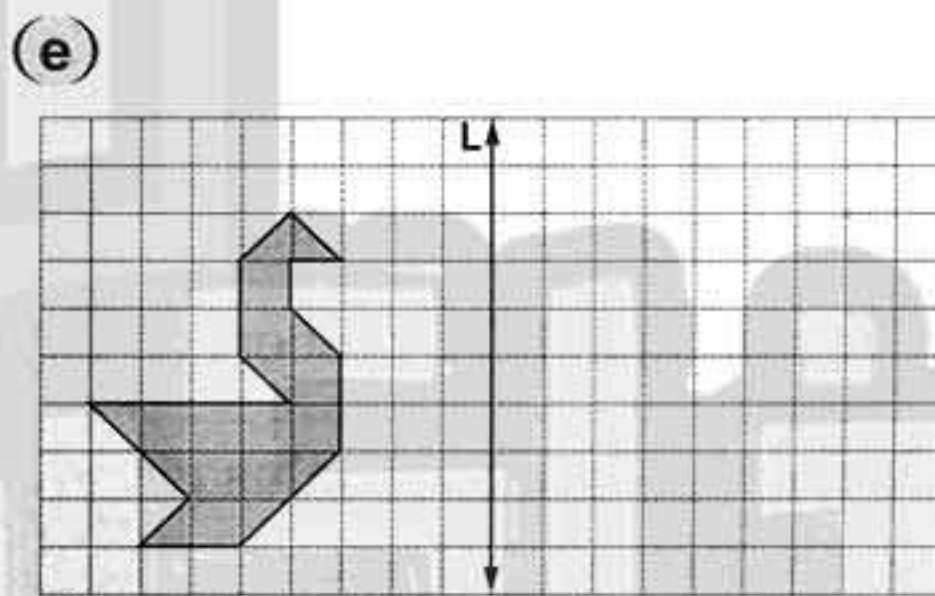
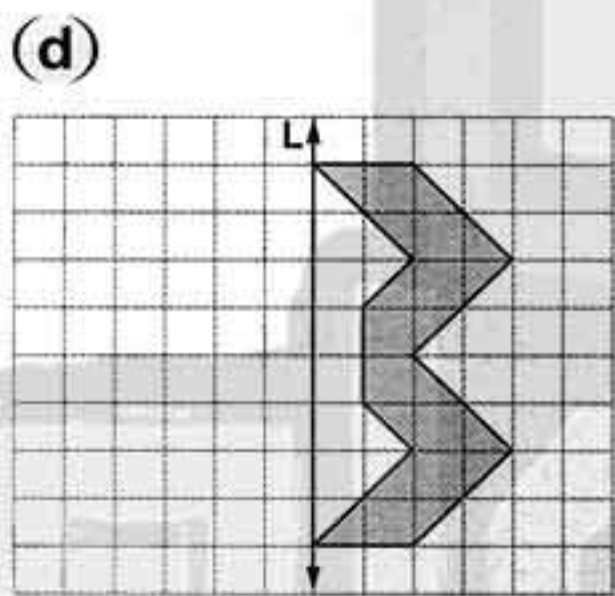
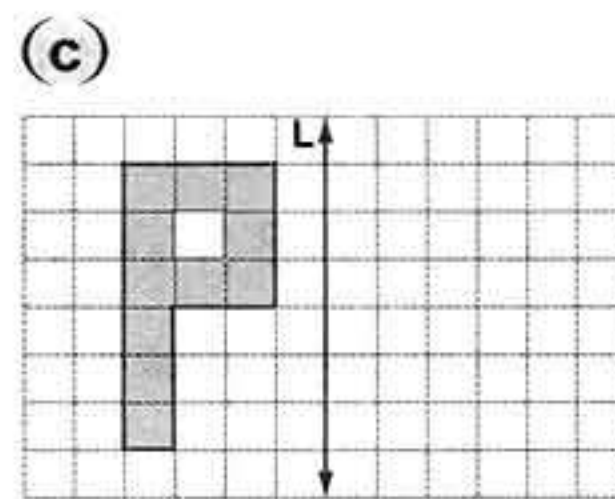
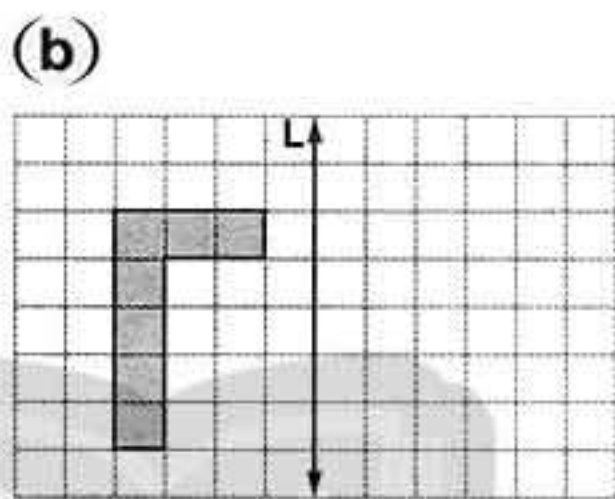
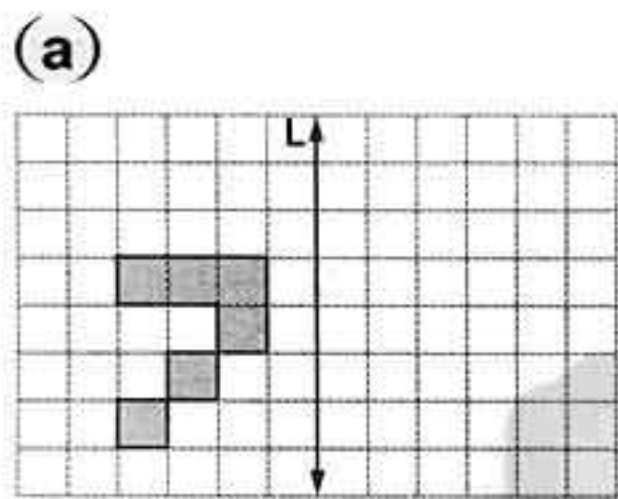


Lesson Two



Challenge

21 In the following figures, draw the image of the colored figure by reflection across L.



22 Critical thinking: Sketch the next figure in the sequence below:



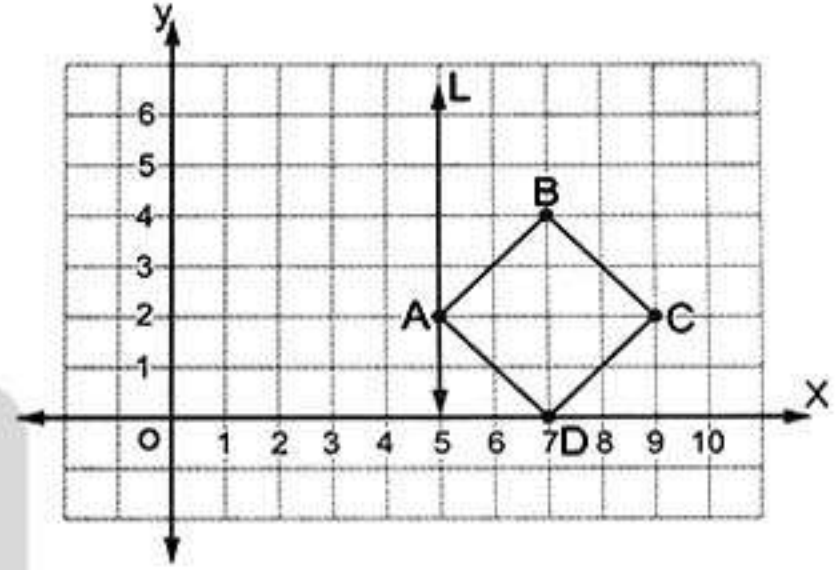
## Unit Four

## General exercises on unit four from the school book

- ① In the cartesian coordinates plane.  
Find the image of the square by  
reflection on the straight line L where  
A (5 , 2) , B (7 , 4) , C (9 , 2) , D (7 , 0)

Then complete :

- (a) The image of A by reflection in  
the straight line L is ( ..... , ..... )
- (b) The image of B by reflection in the straight line L is ( ..... , ..... )
- (c) The image of C by reflection in the straight line L is ( ..... , ..... )
- (d) The image of D by reflection in the straight line L is ( ..... , ..... )



- ② In the cartesian coordinates plane,  
from the following figure :

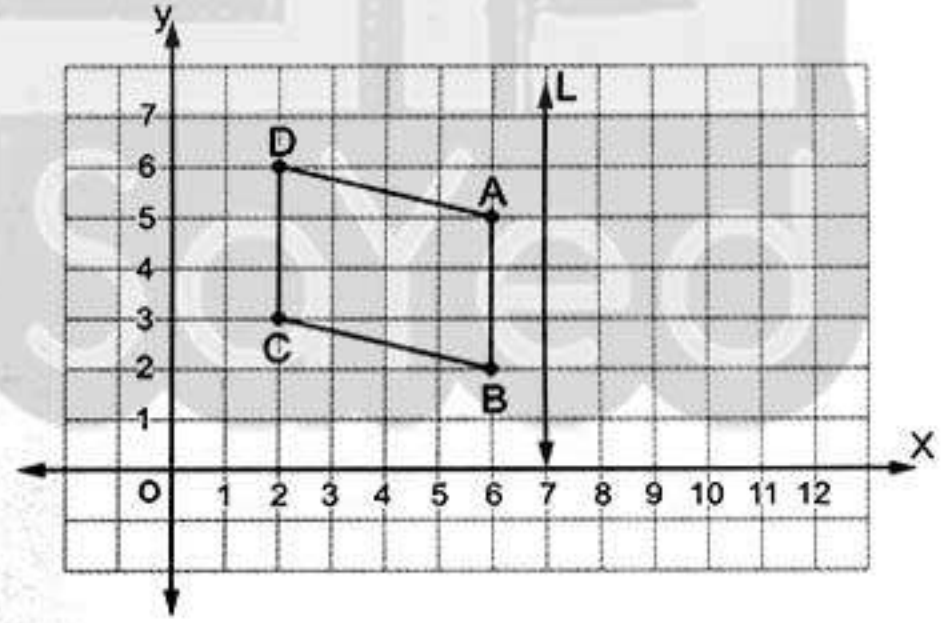
First : Complete :

- A ( ..... , ..... )
- B ( ..... , ..... )
- C ( ..... , ..... )
- D ( ..... , ..... )

Second :

If L is the axis of reflection of the figure ABCD Find the image of the  
figure by reflection in the straight line L, then complete.

- (a) The image of A by reflection in the straight line L is  $\hat{A}$  ( ..... , ..... )
- (b) The image of B by reflection in the straight line L is  $\hat{B}$  ( ..... , ..... )
- (c) The image of C by reflection in the straight line L is  $\hat{C}$  ( ..... , ..... )
- (d) The image of D by reflection in the straight line L is  $\hat{D}$  ( ..... , ..... )





## General exercise

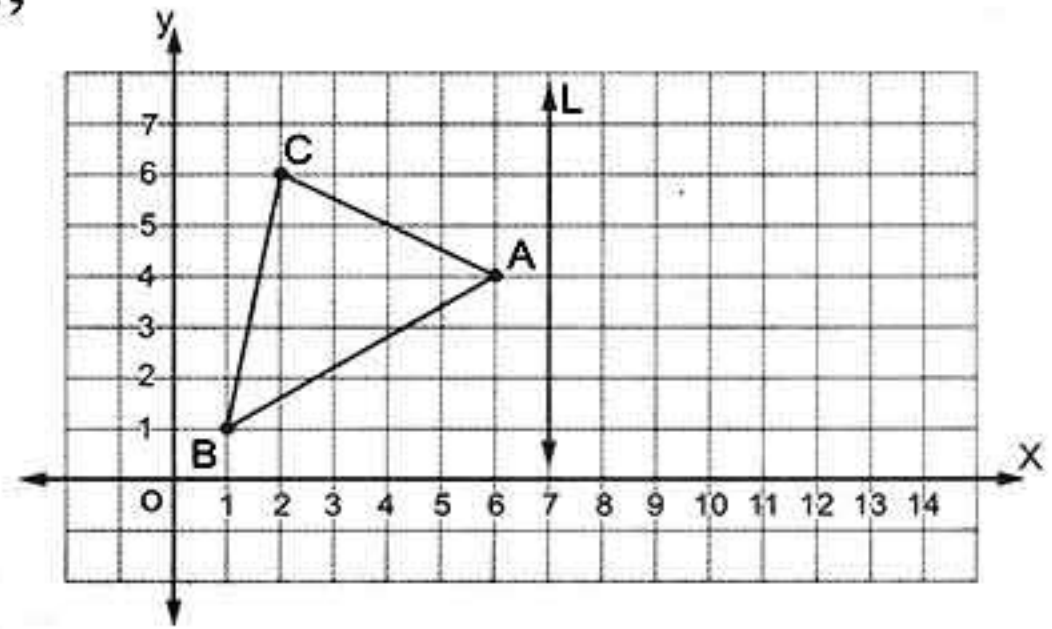
- 3 In the cartesian coordinates plane,  
from the following figure :

First : Complete :

A ( ..... , ..... )

B ( ..... , ..... )

C ( ..... , ..... )



Second :

If L is the axis of reflection of the figure ABC. Find the image of the figure by reflection in the straight line L, then complete.

- (a) The image of A by reflection in the straight line L is  $\hat{A}$  ( ..... , ..... )  
 (b) The image of B by reflection in the straight line L is  $\hat{B}$  ( ..... , ..... )  
 (c) The image of C by reflection in the straight line L is  $\hat{C}$  ( ..... , ..... )

- 4 In the cartesian coordinates plane,  
from the following figure :

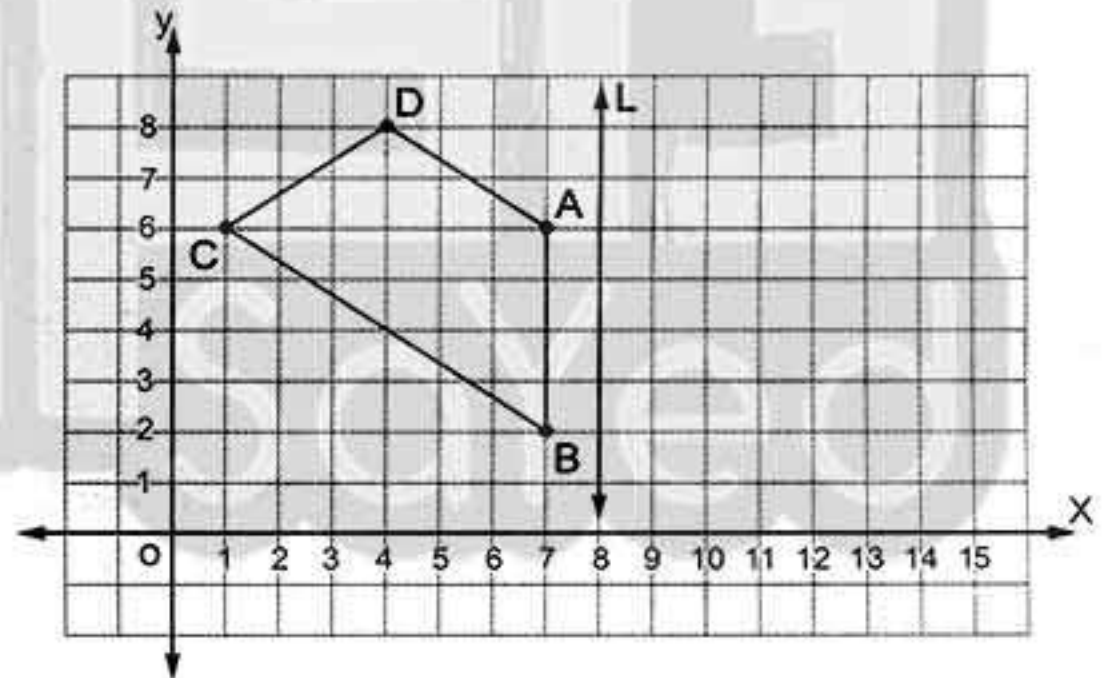
First : Complete :

A ( ..... , ..... )

B ( ..... , ..... )

C ( ..... , ..... )

D ( ..... , ..... )



Second :

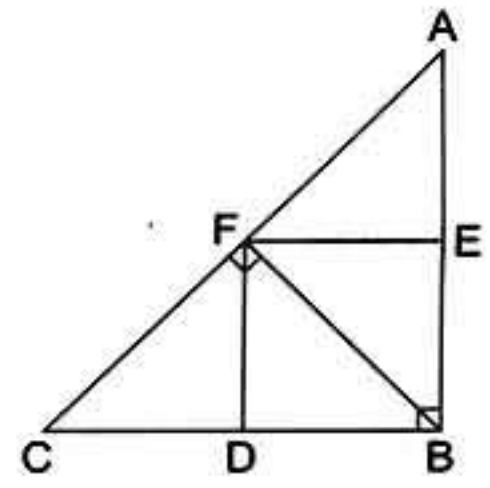
If L is the axis of reflection of the figure ABCD. Find the image of the figure by reflection in the straight line L, then complete.

- (a) The image of A by reflection in the straight line L is  $\hat{A}$  ( ..... , ..... )  
 (b) The image of B by reflection in the straight line L is  $\hat{B}$  ( ..... , ..... )  
 (c) The image of C by reflection in the straight line L is  $\hat{C}$  ( ..... , ..... )  
 (d) The image of D by reflection in the straight line L is  $\hat{D}$  ( ..... , ..... )

## Unit Four

5 In the opposite figure complete :

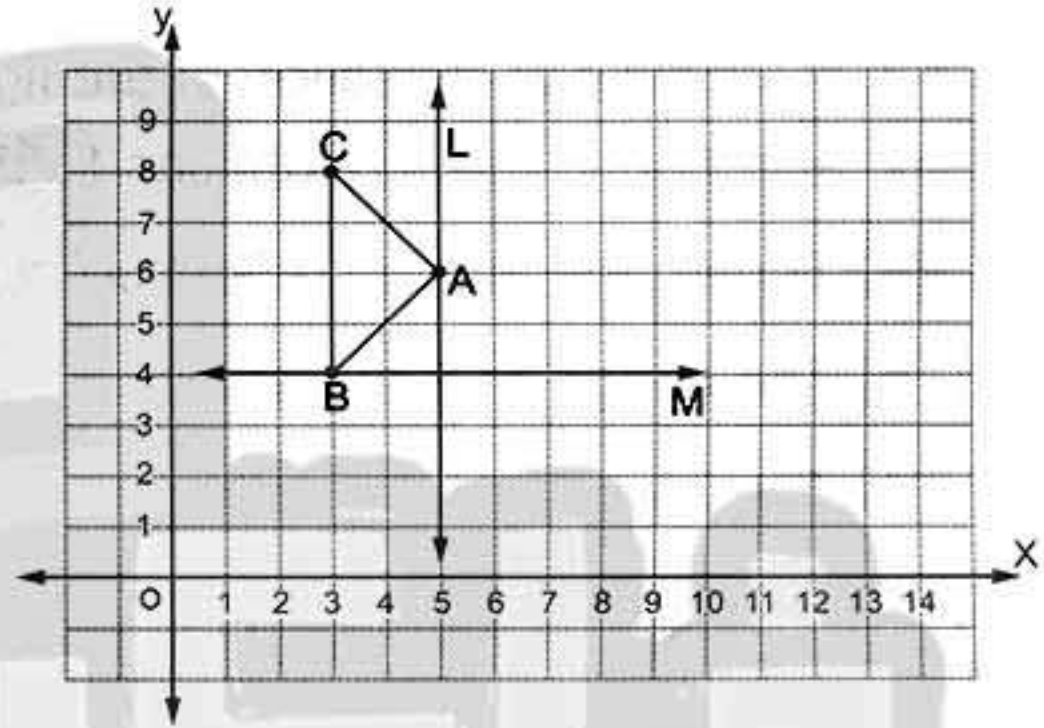
- (a)  $\triangle BEF$  is the image of  $\triangle AEF$  by reflection in  $\longleftrightarrow$  .....
- (b)  $\triangle BDF$  is the image of  $\triangle CDF$  by reflection in  $\longleftrightarrow$  .....



6 In the opposite figure , it represents the cartesian :

coordinates plane :

- (a) Determine the coordinates of the point A , B and C
- (b) Draw  $\triangle A'B'C'$  the image of  $\triangle ABC$  by reflection in the straight line L, then determine the coordinates of the vertices  $A'$  ,  $B'$  and  $C'$
- (c) Draw  $\triangle A''B''C''$  the image of  $\triangle ABC$  by reflection in the straight line M and determine the coordinates of the vertices  $A''$  ,  $B''$  and  $C''$ .



7 In the cartesian coordinates :

- (a) Determine the positions of the points A (8 , 5) , B (8 , 2) , C (5 , 2) , D (5 , 7).
- (b) Draw the line segments  $\overline{AB}$  ,  $\overline{AD}$  ,  $\overline{CD}$  ,  $\overline{BC}$
- (c) If  $\overline{CD}$  is the axis of reflection of the figure ABCD. Determine the image of the figure using the suitable symbols, then determine each of the ordered pairs which represent the vertices.

## Test on Unit Four

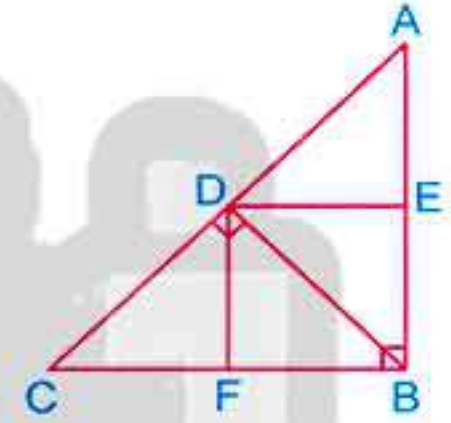


1 Choose the correct answer from the given ones :

- ① The number of lines of symmetry of a rectangle is .....  
( 0 or 1 or 2 or 4 )
- ② There are ..... axes of symmetry of an equilateral triangle.  
( 0 or 1 or 2 or 3 )
- ③ The isosceles trapezium has ..... line(s) of symmetry.  
( 0 or 1 or 2 or 5 )

④ In the opposite figure :

The image of  $\triangle AED$  by reflection across  $\overrightarrow{DE}$  is .....



(  $\triangle BED$  or  $\triangle BFD$  or  $\triangle DFC$  or  $\triangle BDC$  )

- ⑤ The regular hexagon has ..... axes of symmetry.  
( 0 or 2 or 6 or 4 )

⑥ The shown transformation is called .....



( reflection or rotation or translation )

2 Complete each of the following :

⑦ The symmetry axis divides the figure into two ..... halves.

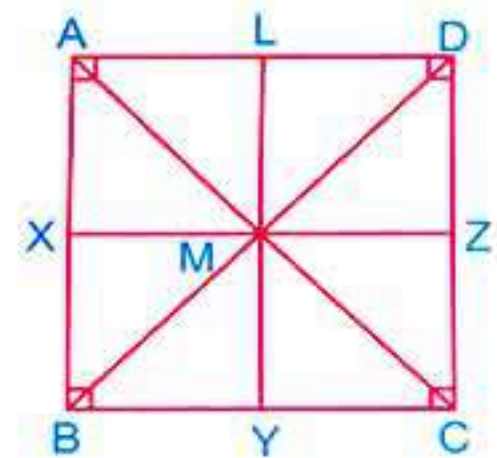
⑧ In the opposite figure :

$\triangle ALM$  is the image of  $\triangle DLM$


by reflection across .....

and  $\triangle$  ..... is the image of  $\triangle BXM$

by reflection across  $\overrightarrow{XM}$



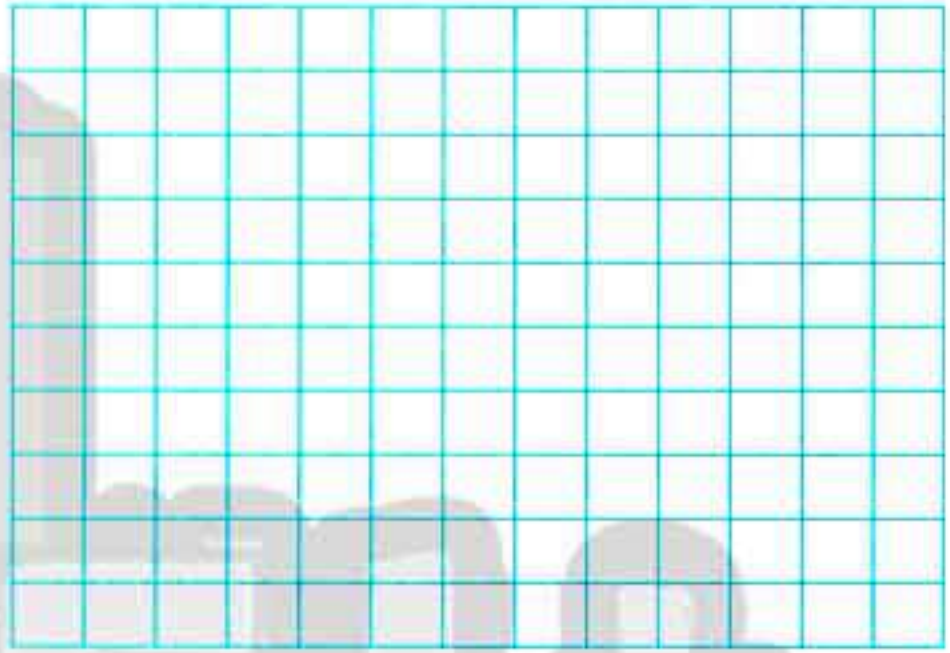
- 9 A diagonal of the rectangle divides it into two ..... triangles, but it is not ..... for the rectangle.

- 10 The figure  has ..... line(s) of symmetry.

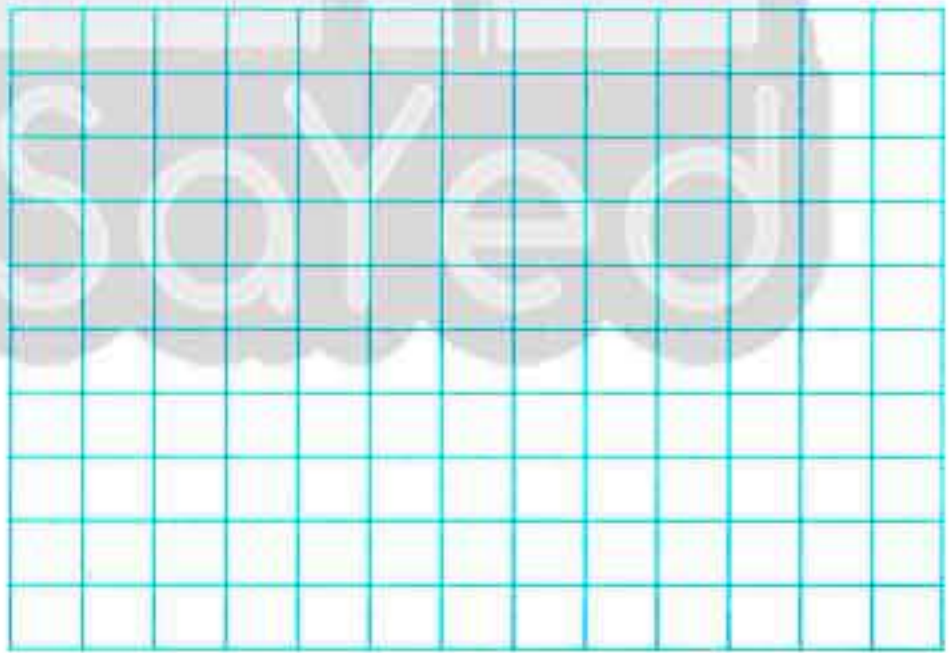
### 3 Answer the following :

- 11 On a coordinate plane , draw the figure ABCD where A (1 , 1) , B (4 , 1) , C (4 , 3) and D (1 , 3) , then find :

- (1) The length of  $\overline{AB}$   
(2) The name of the figure ABCD



- 12 On the coordinate plane , draw the triangle ABC where A (2 , 1) , B (5 , 1) and C (5 , 5) , then draw the image of the triangle ABC by reflection across  $\overleftrightarrow{BC}$



## Sheet 4

From lesson 1 unit 1  
to lesson 4 unit 1

Total mark  
25

1 Use the properties of multiplication to find :

- (a)  $25 \times 12 \times 4$  (b)  $135 \times 74 + 135 \times 26$   
(c)  $4 \times 8 \times 25 \times 125$  (d)  $53 \times 99$   
(e)  $29 \times 101$

5

2 Write "possible or impossible" in  $\mathbb{N}$  :

- (a)  $35 + 7$  ( ..... ) (b)  $\frac{0}{5}$  ( ..... )  
(c)  $10 \div 0$  ( ..... ) (d)  $\frac{21 - 21}{21 + 21}$  ( ..... )  
(e)  $\frac{3}{3 - 3}$  ( ..... )

5

3 Complete :

- (a) The multiplicative identity element is .....  
(b)  $70 \times 13 - \dots \times 13 = 50 \times 13$   
(c)  $(a \times b) \times c = a \times (b \times c)$  is called ..... property.  
(d)  $(12 + 8) \div 2 = \dots$   
(e) The set of natural numbers less than 5 is .....

5

4 Choose the correct answer :

- (a) The product of any two natural numbers .....  $\mathbb{N}$   
(  $\in$  or  $\notin$  or  $\subset$  or  $\not\subset$  )  
(b)  $8 \times 54 = \dots$   
(  $8 \times 5 + 8 \times 4$  or  $8 \times 5 + 8 \times 40$  or  $8 \times 50 + 8 \times 4$  )  
(c)  $3 \times (2 + \dots) = 24$  ( 2 or 3 or 6 or 8 )  
(d) An odd number  $\times$  an even number = ..... number  
( odd or even or prime )  
(e) The additive identity element in  $\mathbb{N}$  is .....  
( 0 or 1 or 2 or 3 )

5

5 If  $x = 3$  ,  $y = 2$  and  $z = 5$  , find the value of :

- (a)  $x \times y + y \times z$  (b)  $(x - y) \times z$   
(c)  $(z + x) \times y$  (d)  $2 \times x + 4 \times y - z$

5



## Sheet

## 5

From lesson 1 unit 1  
to lesson 5 unit 1

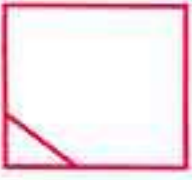
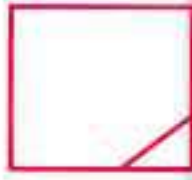














Total mark  
25

1 Complete each of the following patterns :

- (a) 2 , 22 , 222 , ..... , ..... , .....  
 (b) 2 , 4 , 8 , ..... , ..... , .....  
 (c) 1 , 3 , 6 , 10 , ..... , ..... , .....  
 (d) 4 , 9 , 14 , 19 , ..... , ..... , .....  
 (e) 1 , 4 , 9 , ..... , ..... , .....

5

2 Complete each of the following patterns :

- (a)  ,  ,  , .....  
 (b)  ,  ,  ,  , ..... , .....  
 (c)  ,  ,  , .....  
 (d)  ,  ,  , .....  
 (e)  ,  ,  , .....

5

3 (a) Consider the sequence : 1 , 3 , 6 , 10 , 15 , .....

What is the tenth term ?

(b) Find the seventh term in the sequence : 1 , 3 , 7 , 15 , 31 , .....

4

4 Use the properties in  $\mathbb{N}$  to find each of the following :

- (a)  $43 + 55 + 57 + 45$  (b)  $4 \times 16 \times 25$   
 (c)  $18 \times 69 + 18 \times 31$  (d)  $65 \times 102$

6

5 Put ( $\checkmark$ ) for the correct statement and ( $\times$ ) for the incorrect one :

- (a)  $12.1 \in \mathbb{N}$  ( ) (b)  $\{1, 2, 3, 4\} \subset \mathbb{C}$  ( )  
 (c)  $14 + 2 = 2 + 14$  ( ) (d)  $\emptyset \subset \mathbb{N}$  ( )  
 (e)  $7 \div 0 = 0$  ( )

5

## Sheet 6

From lesson 1 unit 1  
to lesson 1 unit 2

Total mark  
25

1 Complete using a suitable symbolic expression :

- (a) Add 3 to the number A , the symbolic expression is .....
- (b) subtract 2 from the number B , the symbolic expression is .....
- (c) Multiply 7 by the number C , the symbolic expression is .....
- (d) Divide the number M by 5 , the symbolic expression is .....

4

2 Translate into symbolic expression :

- (a) Six more than a number  $x$
- (b) Three times of a number  $y$
- (c) A number  $m$  decreased by 4
- (d) Quotient of a number  $n$  by 2
- (e) 8 is added to the double of a number  $d$

5

3 Choose the correct answer :

- (a) Five times the number K is .....  
(  $K + 5$  or  $K - 5$  or  $K \div 5$  or  $5K$  )
- (b)  $0.12 \dots\dots N$  (  $\in$  or  $\notin$  or  $\subset$  or  $\not\subset$  )
- (c) What is the missing number ? 1 , 4 , 16 , 64 , ..... , 1024 , 4096  
( 96 or 192 or 256 or 342 )
- (d)  $72 + 84 = 84 + \dots\dots$  ( 70 or 72 or 74 or 100 )
- (e) Nader is  $x$  years old now , how old will he be after 3 years ?  
(  $3x$  or  $3 + x$  or  $x - 3$  or  $x + 3$  )

5

4 Write each symbolic expression in words :

- (a)  $m + 3$  (b)  $6n$  (c)  $7 - l$
- (d)  $\frac{k}{9}$  (e)  $2a + 1$  (f)  $3h - 4$

6

5 (a) Use the properties to find the result of :

- (1)  $25 \times 31 \times 4$  (2)  $28 + 17 + 72 + 83$

5

(b) List each of the following sets and represent them on the number line :

- (1) A is the set of natural numbers which are less than or equal 6
- (2) B is the set of natural numbers which lying between 2 and 9

## Sheet

## 7

From lesson 1 unit 1  
to lesson 2 unit 2

Total mark  
25

1 Write down a mathematical relation  $x$  and  $y$  for each of the following :

- If the number  $y$  is 7 more than the number  $x$
- If the number  $y$  is two times the number  $x$
- If the number  $y$  is 3 less than the number  $x$
- If the number  $x$  is the quotient of the number  $y$  by 5
- If the number  $x$  is twice the difference between  $y$  and 4

5

2 If the price of a shirt is L.E. 75 , the price of  $x$  shirts is  $y$  , then write a mathematical relation between  $x$  and  $y$

2

3 If  $y = 2x + 1$  is a mathematical relation between  $x$  and  $y$  , then complete the table :

5

$x$	3	1	0	.....	.....
$y$	.....	.....	.....	5	11

4 Complete :

5

- The multiplicative identity element in  $\mathbb{N}$  is .....
- If three times of the number  $m$  is added to 7 , then the expression that expresses this is .....
- $35 \times 36 + 35 \times 64 = 35 \times \dots = \dots$
- 3 , 3 , 6 , 9 , 15 , ..... , ..... (in the same pattern)
- Ahmed and Mona together have 20 books , if Ahmed has  $x$  books , then Mona has ..... books.

5 (a) Represent each set of the following on the number line :

8

(1)  $X = \{0, 2, 4, 6\}$

(2)  $Y = \{1, 3, 5, 7, \dots\}$

(b) If  $x = 2$  ,  $y = 3$  and  $z = 5$  , find the value of :

(1)  $\frac{x+y}{z}$

(2)  $3 \times z + x - y$

## Sheet 8

From lesson 1 unit 1  
to lesson 3 unit 2

Total mark  
25

1 Solve each of the equations :

(a)  $x + 3 = 7$

(b)  $f - 6 = 6$

(c)  $3a = 21$

(d)  $k + 4 = 2$

(e)  $5x + 3 = 13$

(f)  $25 - m = 19$

6

2 Translate each verbal statement into an equation :

(a) The sum of the number  $x$  and 7 is 12(b) The difference of the number  $t$  and 9 is one where  $t$  is greater than 9(c) Three times of a number  $k$  is 12(d) If 5 is subtracted from a number  $n$ , then the result is six(e) When the number  $N$  is divided by 5, then the result is 4

5

3 (a) Find the number which if added to 5, the sum is 8

(b) The product of a number  $m$  and 7 is 56, find the number  $m$ 

4

4 Choose the correct answer :

(a)  $y \times 12 = 96$ , then  $y = \dots\dots\dots$  ( 10 or 9 or 8 or 7 )(b) The least natural number is  $\dots\dots\dots$  ( 10 or 1 or 0 or 2 )(c)  $32 \times 53 + 32 \times \dots\dots\dots = 32 \times 100$  ( 53 or 47 or 37 or 23 )(d) The side length of a square is  $t$ , its perimeter =  $\dots\dots\dots$   
(  $t+4$  or  $4t$  or  $2t$  or  $t-4$  )(e) If  $x = 3$  and  $y = 5$ , then  $4x - 2y = \dots\dots\dots$   
( 2 or 5 or 22 or 14 )

5

5 (a) Solve the equation :

$2x + 7 = 17, x \in \mathbb{N}$

(b) Use the properties to find the value of :

(1)  $672 + 299 + 328 + 701$

(2)  $25 \times 917 \times 4$

5

## Sheet

3

From lesson 1 unit 3  
to lesson 3 unit 3

Total mark  
25

1 Calculate the area of each of the following squares :

- (a) If the side length is 6 cm.  
(b) If the side length is 4.5 cm.  
(c) If the diagonal length is 8 cm.  
(d) If the diagonal length is 10 cm.

8

2 (a) The area of a square is  $200 \text{ cm}^2$ . Find the length of its diagonal.

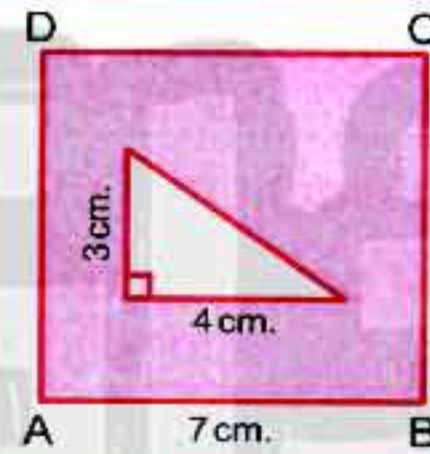
(b) Find the area of the square whose perimeter is 20 cm.

4

3 In the opposite figure :

ABCD is a square.

Find the area of the shaded part.



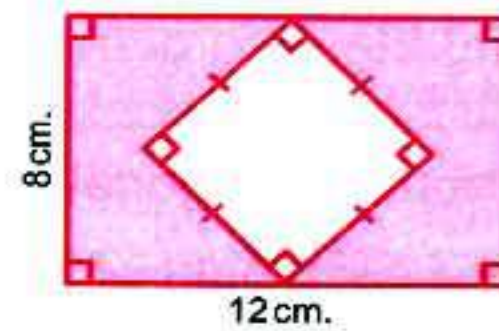
4

4 (a) Find the height of the parallelogram with an area  $48 \text{ cm}^2$  and its base is 8 cm. long.

(b) The length of the base of a triangle is 6 cm. and its height is 4 cm.  
Find the area of this triangle.

6

5 Find the area of the shaded part in the opposite figure.



3

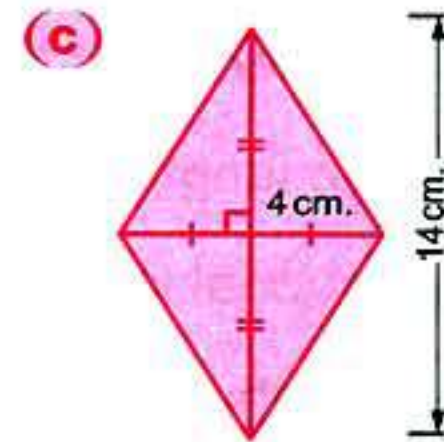
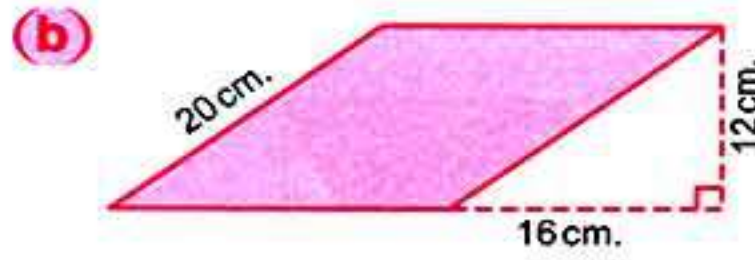
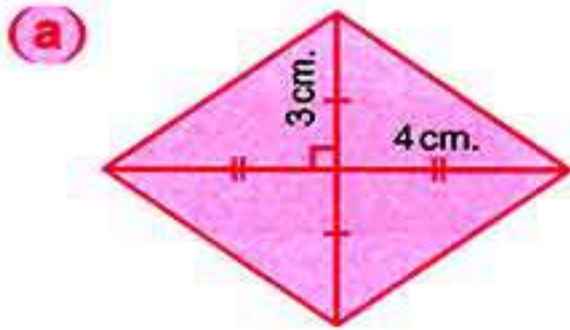
## Sheet

## 4

From lesson 1 unit 3  
to lesson 4 unit 3

Total mark  
25

1 Find the area of each of the following rhombuses :



6

2 (a) The length of the diagonals of a rhombus are 12 cm. and 9 cm.  
Calculate its area.

6

(b) Which is greater in area ? A square of diagonal length 10 cm.  
or a rhombus of diagonal lengths 12 cm. and 8 cm.

3 The side length of a rhombus is 10 cm. , its height is 9.6 cm. and the  
length of one of its diagonals is 12 cm. Calculate the length of the other  
diagonal.

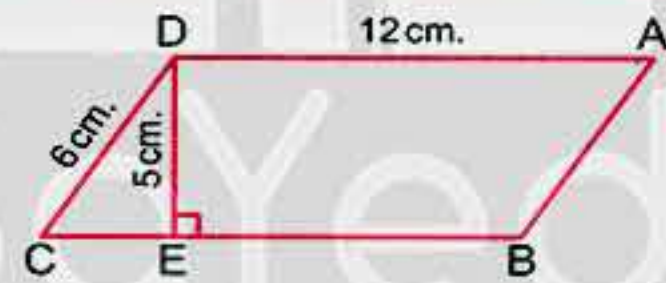
3

4 (a) In the opposite figure :

ABCD is a parallelogram

where  $AD = 12$  cm. and  $\overline{ED} \perp \overline{BC}$

Find the area of the parallelogram.



6

(b) The triangle ABC is right-angled triangle at B ,  $AB = 6$  cm. ,  $BC = 8$  cm.  
Find the area of triangle.

5 A rhombus of diagonal lengths are 8 cm. and 6 cm. , and a parallelogram  
in which the length of its base is 10 cm. and corresponding height is 5 cm.  
Calculate the difference between their areas.

4

## Sheet

## 5

From lesson 1 unit 3  
to lesson 5 unit 3

Total mark  
25

1 Find the circumference of each of the following circles if :

- (a) Its radius length = 5 cm. (Consider  $\pi = 3.14$ )
- (b) Its diameter length = 28 cm. (Consider  $\pi = \frac{22}{7}$ )
- (c)  $r = 7$  cm. (Consider  $\pi = \frac{22}{7}$ )
- (d)  $d = 12$  m. (Consider  $\pi = 3.14$ )
- (e) The length of the longest chord = 21 cm. (Consider  $\pi = \frac{22}{7}$ )

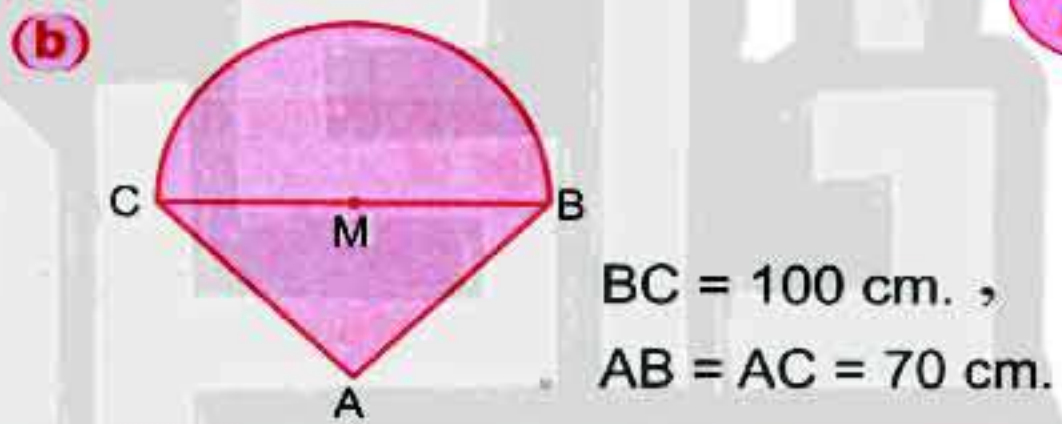
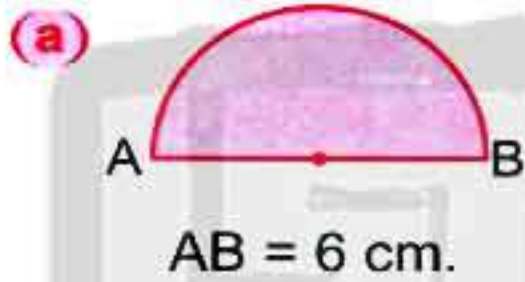


2 Which is longer ?

The circumference of a circle of radius length 3.2 cm. or the perimeter of a square of side length 3.5 cm. (Consider  $\pi = 3.14$ )



3 Calculate the perimeter of each figure (Consider  $\pi = 3.14$ ) :



4 (a) A circle of circumference 66 cm.  
Find the length of its diameter. (Consider  $\pi = \frac{22}{7}$ )

- (b) In the opposite figure :  
Calculate the perimeter of the figure. ( $\pi = 3.14$ )

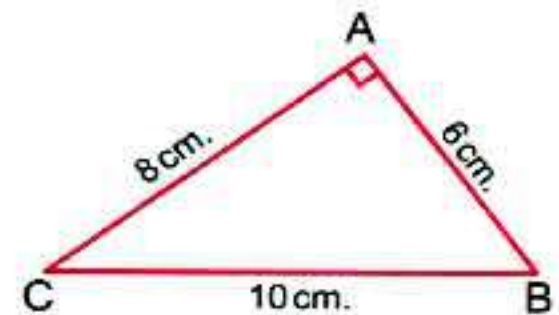


5 (a) Which is greater in area ?

A rhombus in which its diagonals are 8 cm. and 6 cm. or a parallelogram in which its base is 10 cm. and the corresponding height is 5 cm.

(b) In the opposite figure :

The triangle ABC is a right angled-triangle at A , where AC = 8 cm. , AB = 6 cm. and BC = 10 cm.  
Find the area of the triangle.



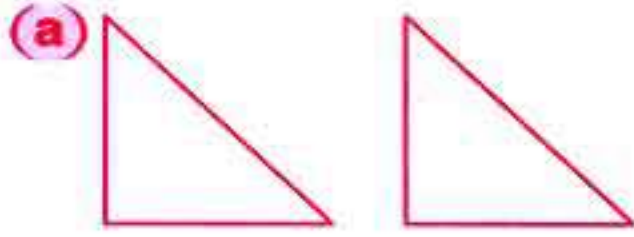
## Sheet

## 6

From lesson 1 unit 3  
to lesson 1 unit 4

Total mark  
25

- 1 Tell whether each transformation is the result of a reflection, a translation or a rotation :



3

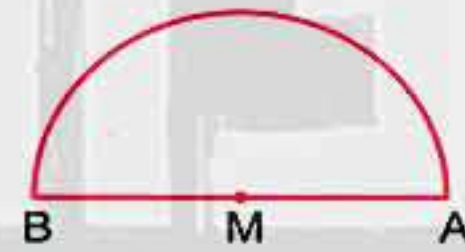
- 2 In each of the following figures, if the figure is symmetrical, draw all the axes of symmetry to it :



6

- 3 Calculate the perimeter of the opposite figure

where  $AM = 35$  cm. (Consider  $\pi = \frac{22}{7}$ )



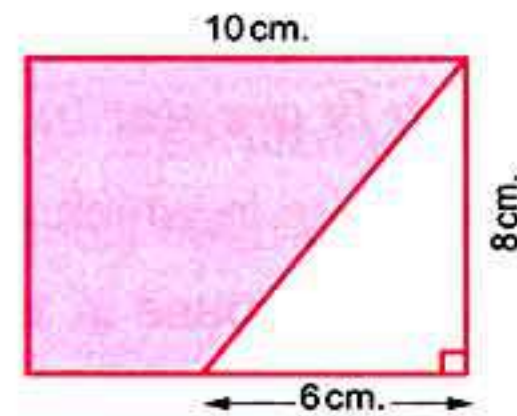
5

- 4 (a) Find the area of square of diagonal length 6 cm.  
(b) Find the height of the parallelogram whose area is  $72 \text{ cm}^2$  and its base length is 9 cm.

6

- 5 In the opposite figure :

Find the area of the shaded part.



5



## Sheet

## 7

From lesson 1 unit 3  
to lesson 2 unit 4

Total mark  
25

## 1 Choose the correct answer :

- (a) The number of axes of symmetry of the square .....  
( 0 or 1 or 2 or 4 )
- (b) The area of parallelogram = .....  
(  $b + h$  or  $b - h$  or  $b \times h$  or  $\frac{b}{h}$  )
- (c) The opposite geometric transformation is .....  
( rotation or translation or reflection )
- (d) The area of the rhombus whose diagonals are of lengths 10 cm.  
and 16 cm. = .....  $\text{cm}^2$  ( 160 or 40 or 80 or 60 )

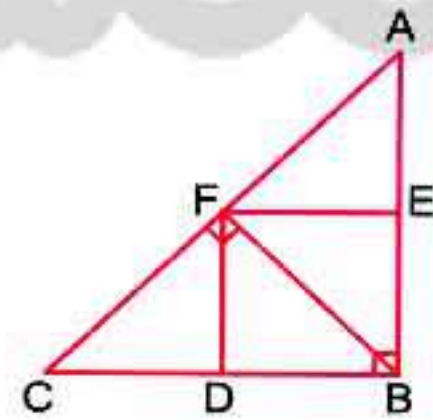
- 2 (a) Which is greater in area ? The triangle whose base length is 12 cm.  
and height = 8 cm. or the parallelogram in which the length of the  
base = 10 cm. and its height = 5 cm.

- (b) Find the circumference of a circle whose diameter length 14 cm.

(Consider  $\pi = \frac{22}{7}$ )

## 3 In the opposite figure , complete :

- (1)  $\triangle AEF$  is the image of  $\triangle BEF$  by reflection in .....
- (2)  $\triangle ABF$  is the image of  $\triangle CBF$  by reflection in .....
- (3)  $\triangle EBF$  is the image of  $\triangle$  ..... by reflection in  $\overrightarrow{BF}$



- 4 In the cartesian coordinate plane draw  $\triangle ABC$  in which  $A(3, 2)$ ,  
 $B(3, 5)$  and  $C(0, 0)$ , then draw its image by reflection in  $\overrightarrow{AB}$

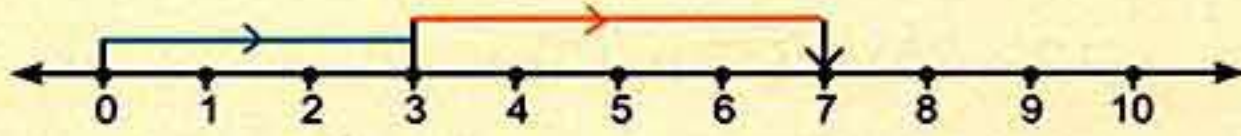
- 5 Which is greater in area ? A square of diagonal length 10 cm. or a triangle  
which its base length 8 cm. and its corresponding height 12 cm.

## EXERCISE 4

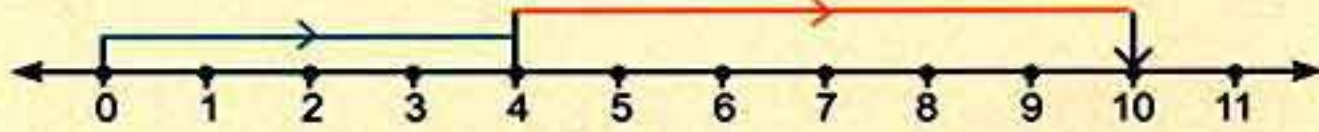
Operations on Natural Numbers  
(Part "A" Addition and Subtraction)

1 Using the given figures, complete:

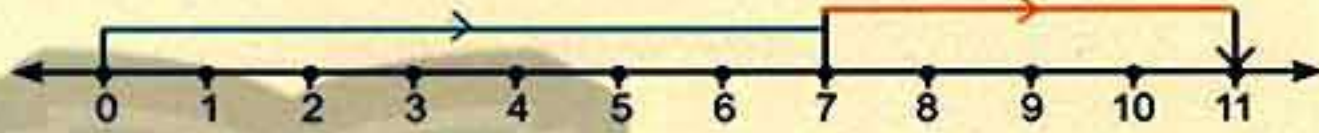
a)  $3 + \dots = \dots$



b)  $4 + \dots = \dots$



c)  $\dots + 4 = \dots$



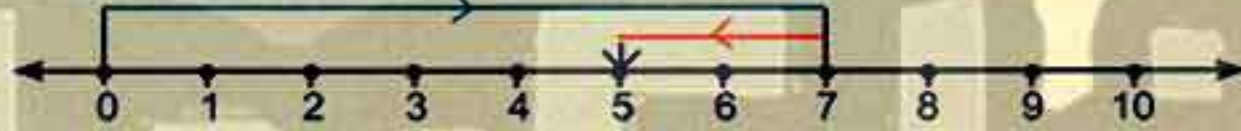
d)  $10 - \dots = \dots$



e)  $9 - \dots = \dots$

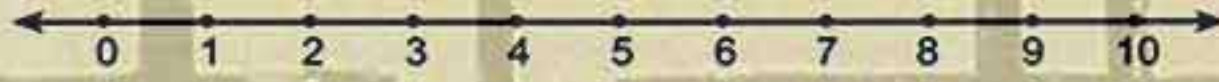


f)  $7 - \dots = \dots$

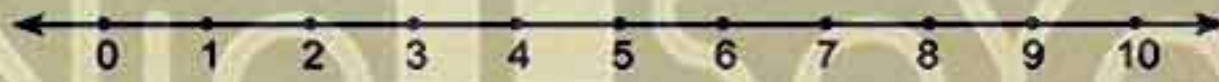


2 Using the number line to represent each of the following if it is possible:

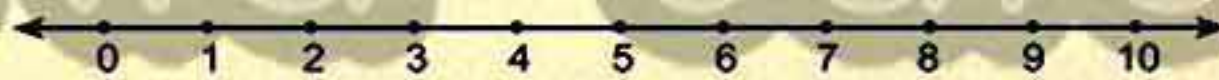
a)  $5 + 3 = \dots$



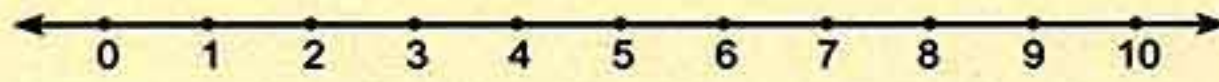
b)  $7 - 3 = \dots$



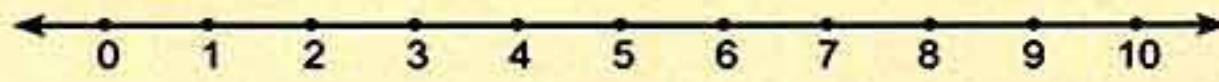
c)  $3 + 1 + 5 = \dots$



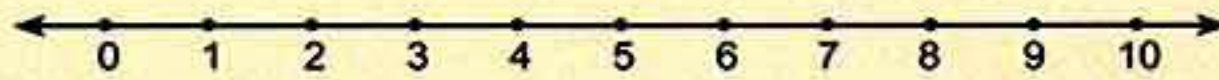
d)  $10 - 3 = \dots$



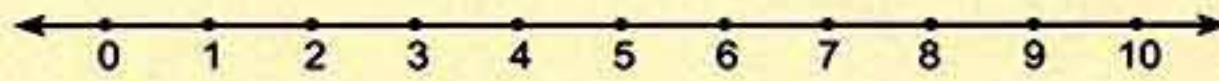
e)  $9 - 4 = \dots$



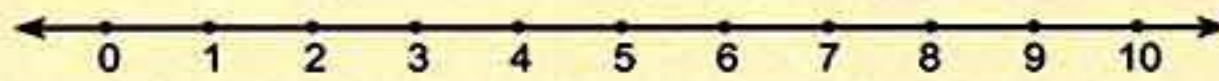
f)  $6 - 6 = \dots$



g)  $13 - 7 = \dots$



h)  $8 - 10 = \dots$



**3 Complete to get a correct statement, then state the property:**

- a)  $715 + 123 = 123 + \dots$  (..... property)
- b)  $0 + 729 = 729 + \dots$  (..... property)
- c)  $\dots + (12 + 75) = (18 + 12) + \dots$  (..... property)
- d)  $a + \dots = \dots + a = a$  (..... property)
- e)  $183 + 317 = \dots + 183$  (..... property)
- f)  $98 + 175 + 402 = 175 + 98 + 402$  (..... property)  
 $= 175 + (\dots + \dots)$  (..... property)  
 $= 175 + \dots = \dots$  (Adding in  $\mathbb{N}$ )
- g)  $117 + 175 + 83 + 825 = 117 + \dots + 175 + 825$  (..... property)  
 $= (117 + \dots) + (175 + 825)$  (..... property)  
 $= \dots + \dots = \dots$  (Adding in  $\mathbb{N}$ )
- h)  $53 + 42 + 47 + 58 = 53 + \dots + 42 + \dots$  (..... property)  
 $= (\dots + 47) + (\dots + 58)$  (..... property)  
 $= 100 + 100 = \dots$  (Adding in  $\mathbb{N}$ )

**4 Using commutative and associative properties in  $\mathbb{N}$  to find:**





(State the property used).

- a)  $812 + 115 + 88$  .....
- b)  $62 + 315 + 38$  .....
- c)  $56 + 113 + 44 + 87$  .....
- d)  $23 + 58 + 42 + 77$  .....
- e)  $19 + 444 + 901 + 536$  .....
- f)  $477 + 876 + 124 + 23$  .....

5 Complete using ( $\in, \notin, \subset, \supset$ ):

- |                     |                          |              |                     |                          |              |
|---------------------|--------------------------|--------------|---------------------|--------------------------|--------------|
| a) $(7 + 2)$        | <input type="checkbox"/> | $\mathbb{N}$ | b) $(27 - 7)$       | <input type="checkbox"/> | $\mathbb{N}$ |
| c) $(9 - 19)$       | <input type="checkbox"/> | $\mathbb{N}$ | d) $(7985 - 10857)$ | <input type="checkbox"/> | $\mathbb{N}$ |
| e) $\{2, 3, 0, 4\}$ | <input type="checkbox"/> | $\mathbb{N}$ | f) $(0.9 + 9.1)$    | <input type="checkbox"/> | $\mathbb{N}$ |
| g) $\{17\}$         | <input type="checkbox"/> | $\mathbb{N}$ | h) $\frac{0}{7}$    | <input type="checkbox"/> | $\mathbb{N}$ |

## 6 Complete using odd or even:

- a)  Odd number + even number = ..... number.
- b)  Sum of two odd numbers = ..... number.
- c)  If  $x$  is an odd number, then  $x + 2$  is an ..... number.
- d)  If  $x$  is an odd number, then  $x - 1$  is an ..... number.
- e) The additive identity number in  $\mathbb{N}$  is an ..... number.
- f)  $(93 + 87) - (87 + 93)$  is an ..... number.



## FOR EXCELLENT PUPILS

7 a) If  $x = 12$ ,  $y = 18$  and  $z = 10$ , then calculate:

$y - (x - z)$  and  $(y - x) + z$  (What do you notice?)

.....

## b) Complete: (using odd or even)

If  $a + 12$  is an even number and  $b + 17$  is an odd number, then  $a + b + 7$  is an ..... number.

## EXERCISE

5

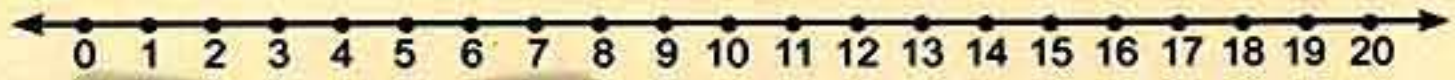
Operations on Natural Numbers  
(Part "B" Multiplication and Division)Interactive  
Exercise

- 1 Draw arrows on the following number lines, to represent each of the following products (as the example):

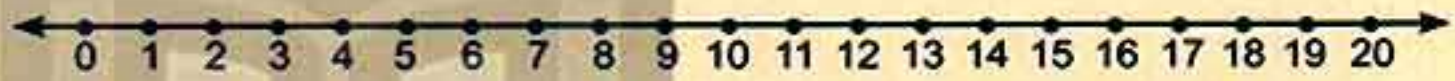
Ex.  $2 \times 5 = 10$



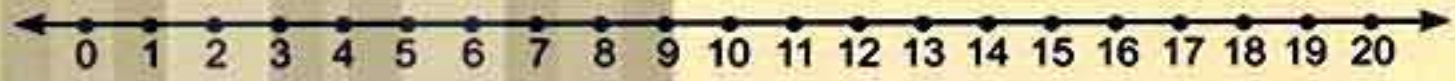
a)  $3 \times 5 = \dots\dots\dots$



b)  $7 \times 2 = \dots\dots\dots$



c)  $4 \times 4 = \dots\dots\dots$



- 2 Put ( $\in$ ,  $\notin$ ):

a)  $\frac{0}{7}$    $\mathbb{N}$

b)  $\frac{1}{2}$    $\mathbb{N}$

c)  $\frac{4}{0}$    $\mathbb{N}$

d)  $\frac{3}{2-2}$    $\mathbb{N}$

e)  $9 \times 0$    $\mathbb{N}$

f)  $(8 \div 8)$    $\mathbb{N}$

g)  $(7 \times 3 - 3 \times 7)$    $\mathbb{N}$

h)  $(7 \times 2 - 7 \times 5)$    $\mathbb{N}$

- 3 Complete each of the following:

a) The additive neutral element is ..... while the multiplicative neutral element is .....

b)  $75 \times 78 = 78 \times \dots\dots\dots$  (..... property)

c)  $19358 \times 1 = \dots\dots\dots \times \dots\dots\dots = \dots\dots\dots$  (..... property)

d)  $177 + 0 = 0 + \dots\dots\dots = \dots\dots\dots$  (..... property)

e)  $76 \times 314 = 76 \times (14 + \dots\dots) = 76 \times \dots\dots + 76 \times \dots\dots = \dots\dots$  (..... property)

f) If  $9 \times 13 = 13 \times x$ , then  $x = \dots\dots\dots$

g)  $(15 - 3) \times (6 \div 2) + 1 = \dots\dots\dots$

h)  $8 \div (8 - 2 \times 3) + 3 \times 2 = \dots\dots\dots$

**4 Complete to find the result, then write the used property:**

- a)  $(4 \times 31) \times 25 = (31 \times \dots) \times 25$  (..... property)  
 $= 31 \times (\dots \times 25)$  (..... property)  
 $= 31 \times \dots = \dots$
- b)  $7 \times (98 + 3) = \dots \times \dots + \dots \times \dots$  (..... property)  
 $= \dots + \dots = \dots$
- c)  $47 \times \dots = 1 \times \dots$  (..... property)  
 $= \dots$
- d)  $2 \times (13 \times 5) = 2 \times (5 \times \dots)$  (..... property)  
 $= (2 \times \dots) \times 13$  (..... property)  
 $= \dots$

**5 Complete using one word (odd or even):**

- a) The product of two odd numbers is .....
- b) The product of two even numbers is .....
- c)  $\text{The product of the smallest prime number and another prime number is } \dots$
- d)  $\text{If } x \text{ is a non-zero even number, then } (x - 1) \text{ is } \dots \text{ number.}$
- e)  $\text{If } x \text{ is a non-zero even number, then } (x - 2) \text{ is } \dots \text{ number.}$
- f)  $\text{An odd number } \times \text{ an even number} = \text{an } \dots \text{ number.}$
- g)  $\text{If } x \text{ is an odd number, then } x - 1 \text{ is } \dots$


**6 Put (✓) or (X) :**

- a) Multiplication operation distributes over addition and subtraction operations in the natural numbers. ( )
- b)  $(81 + 112) \times 117 = 117 \times (112 + 81)$  ( )
- c)  $(28 \div 6) \in \mathbb{N}$  ( )
- d)  $(120 + 80) \times 4 = 120 \times 4 + 80 \times 4$  ( )

**7 Let  $X$  be the set of even numbers between 3 and 8 if  $x \in X$ , then write the values of  $x$  and represent  $\frac{x}{2}$  on the number line.**

8  Arrange the results of the following operations ascendingly:

$$(7 \times 10), (35 - 0), (178 - 178) \text{ and } (2 \times 3) \times 5$$

9  Using commutative, associative and distributive properties, calculate each of the following, then check your answer by calculator:

a)  $2 \times 347 \times 5 = \dots\dots\dots$

b)  $4 \times 128 \times 25 = \dots\dots\dots$


c)  $8 \times 49 \times 125 = \dots\dots\dots$

d)  $125 \times 25 \times 8 \times 4 = \dots\dots\dots$


e)  $275 \times 85 + 275 \times 15 = \dots\dots\dots$

f)  $185 \times 125 - 185 \times 25 = \dots\dots\dots$

g)  $498 \times 1001 - 498 = \dots\dots\dots$

h)   $18 \times 99 = \dots\dots\dots$

i)  $25 \times 102 = \dots\dots\dots$

j)   $915 \times 1001 = \dots\dots\dots$

10 Choose the correct answer from the given ones:

a)  $\frac{0}{7} = \dots\dots\dots$


(not defined or 0 or 1 or 7)

b)  $\frac{27 - 27}{5} = \dots\dots\dots$

(0 or not defined or 5 or 10)

c)  $(24 \div 4) - (18 \div 6) = \dots\dots\dots$

(1 or 2 or 3 or 4)

11  If  $a = 3$ ,  $b = 4$  and  $c = 0$ , then choose the correct value for each of the following from the given ones:

1  $(b - a) \times (b + a) = \dots\dots\dots$

a) 7

b) 8

c) 10

d) zero

2  $(a + b - c) \times (a + b) = \dots\dots\dots$

a) 25

b) 30

c) 60

d) 49



FOR EXCELLENT PUPILS

12 Complete the missing number in each of the following:

a)  $11 \times (75 + 812 + \dots\dots\dots) = 10032$

b)  $125 \times \dots\dots\dots + 25 \times 40 = 2000$

c)  $(\dots\dots\dots \div 12) - (96 \div 8) + 175 = 175$

## EXERCISE 6

## Numerical Patterns



Interactive Exercise

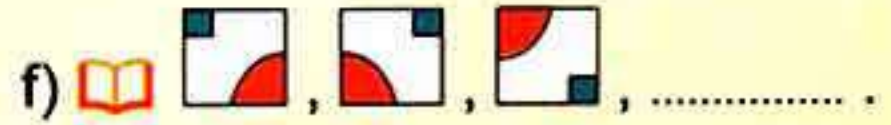
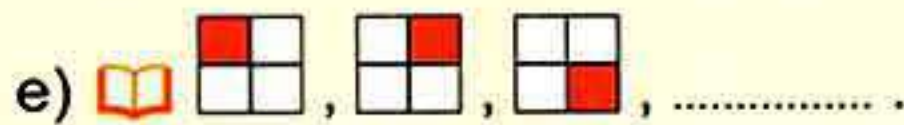
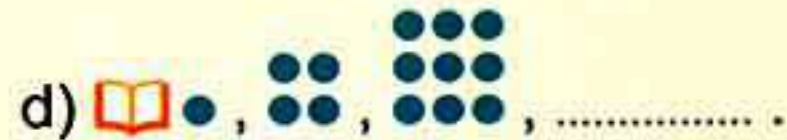
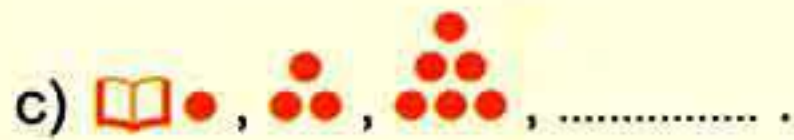
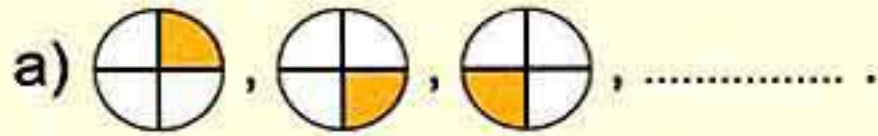
## 1 Complete in the same pattern:

- a) 1, 2, 3, 4, ..... , ..... , .....
- b) 3, 33, 333, ..... , ..... , .....
- c) 5, 15, 25, 35, ..... , ..... , .....
- d) 5, 7, 9, 11, ..... , ..... , .....
- e) 106, 100, 94, 88, ..... , ..... , .....
- f) 1, 3, 9, 27, ..... , ..... , .....
- g) 2, 6, 18, 54, ..... , ..... , .....
- h) 2, 7, 12, 17, ..... , ..... , .....

## 2 Complete each pattern:

- a) 1, 4, 8, 13, ..... , ..... , .....
- b) 89, 79, 70, 62, ..... , ..... , .....
- c) 142, 143, 145, 148, ..... , ..... , .....
- d) ..... , ..... , 8, 11, 14, ..... , ..... , .....
- e) ..... , ..... , 12, 24, 48, ..... , ..... , .....
- f)  $1 \times 1$ ,  $2 \times 2$ ,  $3 \times 3$ , ..... , ..... , .....
- g) 299, 293, 287, 281, ..... , ..... , .....
- h) 480, 492, 486, 498, 492, 504, ..... , ..... , .....

## 3 Complete each of the following visual patterns:






4 Evaluate using the calculator. Write only 5 decimals without approximation as the example, then discover the pattern and complete:

Ex.  $\frac{1}{9} = 0.11111$  ,  $\frac{2}{9} = 0.22222$  ,  $\frac{3}{9} = 0.33333$

- a)  $\frac{4}{9} = \dots\dots\dots$       b)  $\frac{5}{9} = \dots\dots\dots$   
 c)  $\frac{6}{9} = \dots\dots\dots$       d)  $\frac{7}{9} = \dots\dots\dots$




## LIFE PROBLEMS

5  Hany has 3 test rabbits in his lab. If the number of rabbits is doubled each certain period, then the number of rabbits after five periods will be .....



- a) 12      b) 24      c) 96      d) 186

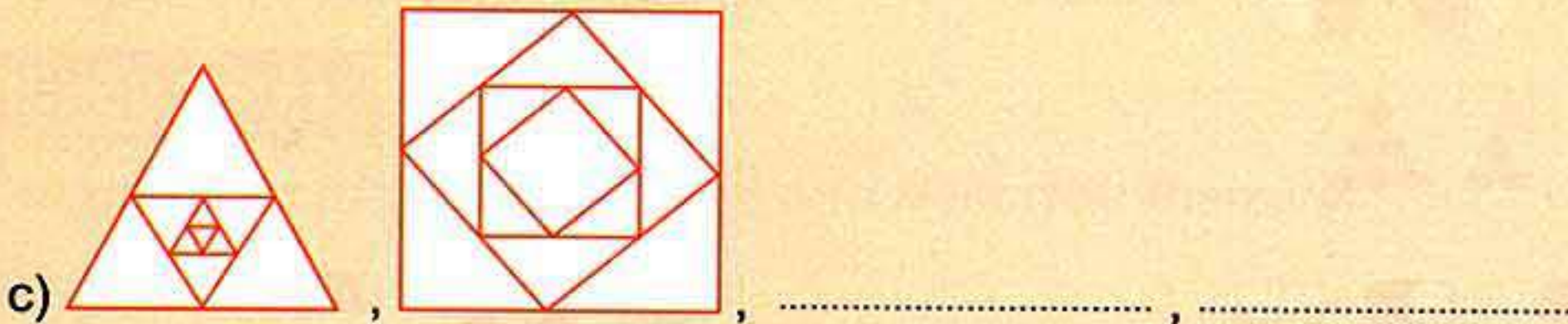
6  Dina paid L.E. 34 for her annual membership card in a science club. Dina told her friend Hanaa that this amount increases by L.E. 11 annually. How much will it be after 10 years?



### FOR EXCELLENT PUPILS

7 Complete in the same pattern:






- a) 502 , 510 , 506 , 514 , 510 , ..... , .....  
 b) 175 , 182 , 176 , 183 , 177 , ..... , .....



## EXERCISE 1

## Mathematical Expressions


1 Complete the table:

Verbal Expression (in words)	Symbolic Expression
a) Adding 3 to the number $a$	.....
b) Subtracting 2 from the number $b$	.....
c)  Subtracting 5 from double of the number $y$	.....
d)  Adding 7 to three times of the number $z$	.....
e)  Subtracting 3 from half of the number $x$	.....
f)  Adding 6 to third of the number $z$	.....
g) Multiplying 5 by the number $m$	.....
h)  Dividing the number $x$ by 2 and add 3 to the result	.....





2  Complete the table:

Number	Add 3	Subtract 7	Multiply by 3	Divide by 4
a) $y$	.....	.....	.....	.....
b) .....	.....	$z - 7$	.....	.....
c) .....	.....	.....	.....	$\frac{l}{4}$

3 Write by using symbol expressions:

- a) 15 subtracted from the number  $Z$  is .....
- b) Double of the number  $l$  is .....
- c)  The parallelogram whose two adjacent sides lengths are  $x$  and  $y$ , then its perimeter is .....
- d) Mostafa has  $x$  pounds. His brother gave him 20 pounds, then what Mostafa has now is ..... pounds.

#### 4 Write by using symbolic expressions:

- a) If the perimeter of a rectangle is 30 cm and its width is  $x$  cm, then its length is ..... cm.
- b) If the length of a square =  $x$  cm, then its perimeter = ..... cm.
- c) Fatma has got 9 pounds. She spent  $y$  pounds, then what remained with her = ..... pounds.
- d) An equilateral triangle, its side length =  $l$  cm, then its perimeter = ..... cm.
- e)  Saeed has got L.E.  $x$ , he took L.E. 8 pounds from his father, then: What he has got now is ..... pounds.
- f)  The length of a rectangle is 3 cm more than its width, if the length is  $l$  cm, then the width will be ..... cm.
- g)  The sum of what Manal and Nihal have is L.E. 10 pounds. If Manal has L.E  $x$ , then Nihal will have L.E ..... .
- h)  If the sum of two numbers is 10 and one of them is  $x$ , then the other = ..... .

#### 5 Choose the suitable symbolic expression of each of the following:

1 Five times of the number  $y$  is

.....

- a)  $5y$                       b)  $y + 5$   
c)  $y - 5$                       d)  $5 - y$

2 9 subtracted from four times of the number  $Z$  is .....

- a)  $4Z \times 9$                       b)  $9 - \frac{Z}{4}$   
c)  $4Z - 9$                       d)  $9 - 4Z$


3 Two numbers one is double the other if the smaller is  $m$ , then the greater is .....

- a)  $2m$                           b)  $m + 2$   
c)  $m - 2$                       d)  $2 - m$


4 Two numbers one of them is third of the other if the greater one is  $x$ , then the other is .....


- a)  $\frac{x}{3}$                               b)  $x + 3$   
c)  $x - 3$                           d)  $3 - x$


6 Choose the correct answer from that between the brackets:

a)  5 subtracted from the number  $x$  is ..... ( $5x$  or  $5 - x$  or  $x - 5$  or  $x + 5$ )

b)  Suzan saved L.E.  $x$ , her father gave her L.E. 10, then she will have ..... ( $x - 10$  or  $x + 10$  or  $10x$  or  $10 - x$ )

c)  3 subtracted from double of the number  $x =$  ..... ( $x - 3$  or  $2x - 3$  or  $3x + 2$  or  $5x$ )

d)  The difference of two numbers is 7, if the smaller number is  $y$ , then the greater number will be ..... ( $7y$  or  $7 - y$  or  $y - 7$  or  $y + 7$ )

e)  The perimeter of a square whose side length is  $x$  cm = ..... ( $4x$  or  $3x$  or  $4 + x$  or  $x + 4$ )

f) Two numbers  $x$  and  $y$ , their sum is 20, then  $y =$  ..... ( $20 + x$  or  $20 - x$  or  $x - 20$  or  $\frac{x}{20}$ )

7 Write each symbolic expression in words:

a)  $10 - x$

b)  $\frac{y}{25}$

c)  $n - 15$

d)  $43 + m$



FOR EXCELLENT PUPILS



8 Complete by writing a symbolic expression for each of the following:

a) On a picnic if 12 people bought  $y$  kg of apples and distributed this amount equally among themselves, then the share of each one is .....

b) If the wage of a worker is 12 pounds per hour, then the symbolic expression of the wage of that worker is "n" days is ..... (knowing that he works  $m$  hours daily)

picnic

نزهة خلوية | distributed

وزع

65



هذا العمل خاص بموقع ذاكرولي التعليمي ولا يسمح بتداوله على مواقع أخرى

## EXERCISE 2

## The Constants and the Variables



Interactive Exercise

## 1 Choose the correct answer:

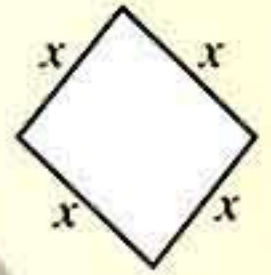
a) If the sum of two numbers  $x$  and  $y$  is 15, then the mathematical relation between  $x$  and  $y$  is ..... ( $x - y = 15$  or  $y = 15x$  or  $x + y = 15$  or  $y = 15 + x$ )

b) Two numbers, one exceeds the other by 3, if the smaller number is  $y$ , then the mathematical relation between  $x$  and  $y$  is  $x =$  .....

( $3y$  or  $y - 3$  or  $y + 3$  or  $\frac{1}{3} y$ )

c) If the side length of a rhombus is  $x$  cm and its perimeter is  $P$ , then the mathematical relation between  $P$  and  $x$  is .....

( $P = 4x$  or  $P = x + 4$  or  $P = x - 4$  or  $P = \frac{x}{4}$ )



d) If we multiply the number " $l$ " by 5 and subtract 6 from the result, then we get .....

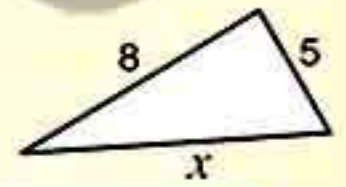
( $6l$  or  $l - 30$  or  $6l - 5$  or  $5l - 6$ )

e) If the side length of a square is  $l$  cm and its perimeter is  $m$  cm, then the mathematical relation between  $l$  and  $m$  is .....

( $l = 4m$  or  $m = 4l$  or  $m = l + 4$  or  $lm = 4$ )



f) If the lengths of the sides of a triangle are 8 cm, 5 cm and  $x$  cm, then its perimeter  $P =$  ..... ( $13 + x$  or  $13 - x$  or  $13x$  or  $\frac{x}{13}$ )



g) If the side length of an equilateral triangle is ( $l$ ) and its perimeter is ( $P$ ), then .....

1)  $P = \frac{1}{3} l$

2)  $P = l + 3$

3)  $P = 3l$

4)  $P = l - 3$


h) If the length of a rectangle equals 12 cm, its width is  $w$  cm and its perimeter is  $P$  cm, then the mathematical relation between ( $w$ ) and ( $P$ ) is .....

1)  $w = P - w$


2)  $w = P - 12$

3)  $w = \frac{P}{2} - 12$


4)  $w = \frac{P}{2} + 12$

- 2  If  $y = 4x$  is the mathematical relation between  $x$  and  $y$ , then complete the table below:

$x$	3	1	5	.....	.....	.....
$y$	.....	.....	.....	24	16	28

- 3  Write the mathematical relation between  $x$  and  $y$ , if the number  $x$  is 9 more than the double of  $y$ .

The mathematical relation is .....

- 4  A factory owner pays the daily wage of one of his workers according to the mathematical relation  $y = 12 + 5x$  where  $x$  is the number of working hours done in overtime,  $y$  is the total daily wage in pounds:

- a) Complete: the constant daily wage = ..... pounds.  
 b) The daily wage and overtime wage = ..... pounds.  
 c) Complete the following table:

Number of overtime hours ( $x$ )	0	1	2	.....	.....	5
Total daily wage ( $y$ )	.....	.....	.....	27	32	.....

- 5  If the price of a meal in a restaurant is L.E. 15 and L.E. 3 are added for delivery service, (it does not matter, how many meals)

- a) How much should be paid in the following cases?  
 1) 1 meal house delivery, you pay L.E. ....  
 2) 3 meals house delivery, you pay L.E. ....  
 3) 4 meals house delivery, you pay L.E. ....

b) If  $y$  represents the total price you have to pay and  $x$  the number of meals you order, then complete:

- 1) The relation between  $y$  and  $x$  is  $y = \dots\dots\dots$
- 2) The variables in this relation are  $\dots\dots\dots$  are  $\dots\dots\dots$
- 3) The constant in this relation are  $\dots\dots\dots$

6 If the monthly salary of an employee is 1300 pounds, he gains L.E. 12 for each extra working hour:


a) Find the mathematical relation between his total salary and the number of extra working hours.

.....



b) Determine the constants and the variables of that relation.

The constants are  $\dots\dots\dots$  and  $\dots\dots\dots$ , the variables are  $\dots\dots\dots$  and  $\dots\dots\dots$

7  Medhat bought  $x$  kg of chocolate and put it in a box that costs L.E. 5. Calculate what Medhat should pay in terms of  $x$ , if the price of 1 kg of chocolate is L.E. 28.



 **FOR EXCELLENT PUPILS**

8 Ali bought 3 T-shirts and one pair of shoes. If the price of one T-shirt is  $x$  and the price of one pair of shoes is 30 pounds more than the price of the T-shirt.



Write the mathematical relation of the total price ( $T$ ) of what Ali paid in terms of  $x$ .



## EXERCISE 3

## Equations

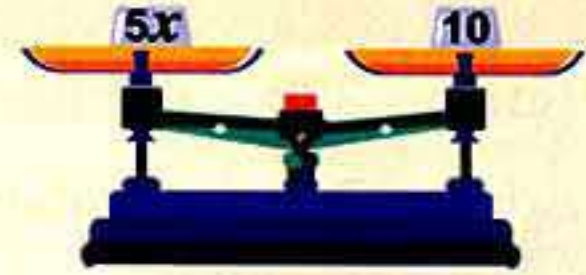
Interactive  
Exercise

1 In each of the following figures, the two pans of the scale are balanced, then complete as in figure (a):

a)

Equation:  $x + 9 = 11$ Solution:  $x = 2$ 

b)



Equation: .....

Solution: .....

c)



Equation: .....

Solution: .....

d)



Equation: .....

Solution: .....

2 Complete the following table as in (a):

Word sentence or (Verbal expression)	The equation
a) Adding 7 to a number produces 25	$x + 7 = 25$
b) Subtracting 5 from a number produces 31	.....
c) Subtracting 5 from three times of a number produces 26	.....
d) Adding 8 to half of a number produces 12	.....
e) Adding 3 to the third of a number produces 9	.....
f) Dividing four times of a number by 7 produces 11	.....
g) Subtracting the double of a number from 11 produces 5	.....



### 3 Solve each of the following equations (as the example):

Ex.  $x + 3 = 12$   
 $x + 3 - 3 = 12 - 3$  so,  $x = 9$

a)  $x - 7 = 25$   
 .....

c)  $y - 5 = 7$   
 .....

e)  $x - 7 = 33$   
 .....

g)  $2x - 2 = 12$   
 .....

b)  $20 - x = 16$   
 .....

d)  $5x + 8 = 33$   
 .....

f)  $9 + y = 44$   
 .....

### 4 Translate each verbal statement into an equation:

- a) The number that if added to 17, we get 28.  
 b) If 9 is subtracted from a number, then the result will be 23.  
 c) If 5 is subtracted from three times of a number, then the result will be 16.

### 5 Match from column (A) what suits in column (B):

(A)	(B)
(a) In a physical education activity 25 students were absent and 15 students were present	(1) $50 - x = 45$
(b) 50 passengers are in a bus, a number of them get off, such that 45 passengers were left.	(2) $x - 25 = 15$
(c) Mostafa bought 3 notebooks, he gave 20 pounds to the seller who gave him back 5 pounds.	(3) $x + 10 = 24$
(d) Ahmed has got $x$ pounds, Samir has got 10 pounds, the sum of what they have together = 24	(4) $50 - 3x = 9$
(e) Ramy saved L.E 50, he bought 3 copy books for L.E $x$ each one, then L.E 9 remained with him.	(5) $20 - 3x = 5$

6 Write down a real life situation that expresses each of the following equations:

a)  $x + 7 = 29$

b)  $x - 5 = 19$

c)  $40 - y = 32$

### MENTAL MATHS

7 Find the solution without doing steps:

1) Find the value of  $x$  in each of the following:

a)  $33 + x = 9 + 33$

b)  $75 \times x = 28 \times 75$

c)  $22x = 22$

d)  $x \times 67 = (9 \times 7) + (9 \times 60)$

e)  $(8 \times 25) + (8 \times 75) = 8 \times x$

f)  $x + (27 + 37) = (17 + 27) + 37$

2) Find the value of  $x$  in each of the following:

a)  $22 + x = 9 + 22$

b)  $35 + x = 18 + 35$

c)  $7x = 117 \times 7$

d)  $12 \times (17 \times x) = (12 \times 17) \times 32$

e)  $3 \times 52 = (x \times 2) + (x \times 50)$

f)  $(7 \times 9) + (x \times 5) = 7 \times 14$

3) Solve each of the following equations: (mentally)

a)  $24x = 61 \times 24$

b)  $6 \times 14 = 6 \times (x + 5)$

c)  $8 \times 45 = x(35 + 10)$

d)  $(x + 2) \times 7 = 7 \times 8$

e)  $573 = x + (7 \times 10) + (5 \times 100)$

f)  $482 = (4 \times x) + (8 \times 10) + 2$

g)  $42 = 2 + x \times 10$

h)  $x \times 7 + x \times 50 = 2 \times 57$



## FOR EXCELLENT PUPILS

8 Complete by using (+ or - or ÷) to make each of the following true:

a) The solution of the equation  $2x \dots\dots\dots 3 = 15$  is  $x = 9$

b) The solution of the equation  $m \dots\dots\dots 7 = 28$  is  $m = 21$

c) The solution of the equation  $3y \dots\dots\dots 8 = 17$  is  $y = 3$

d) The solution of the equation  $2z \dots\dots\dots 9 = 4$  is  $z = 18$

9 Complete:

If Ahmed had L.E. Z and he bought 7 books for L.E. x each and 3 notebooks for L.E. y each, then L.E 17 was left with him.

The mathematical relation between x, y and Z is .....

.....  
 .....



Assess your skills & solve Interactive Exercises after each lesson..

[www.aladwaa.com](http://www.aladwaa.com)



## Selected Problems from Previous Exams



# 2

on Unit

### 1 Choose the correct answer:

- ① If the age of a man now is  $x$  years old, then his age after 7 years = .....  
( $x - 7$  or  $x + 7$  or  $7x$  or  $x + 7$ ) (Cairo 2017)
- ② If  $x + 8 = 15$ ,  $x \in \mathbb{N}$ , then  $x =$ ..... . (3 or 7 or 6 or 5) (Cairo 2017)
- ③ Subtracting 9 from the number  $x =$  .....  
( $9 - x$  or  $x - 9$  or  $8x$  or  $9x$ ) (Giza 2017)
- ④ Adding 8 to double  $x$ , the symbolic expression is .....  
( $2x + 8$  or  $8 - 2x$  or  $x + 8$  or  $8 + 3x$ ) (Giza 2016)
- ⑤ If we multiply the number  $x$  by 7, then we subtract from the result 3, we shall get .....  
( $7x + 3$  or  $3x + 7$  or  $7x - 3$  or  $3 - 7x$ ) (Alex. 2016)
- ⑥ The sum of two numbers  $a$  and  $b$  is 10, then  $b =$  .....  
( $10 - a$  or  $a - 10$  or  $a + 10$  or  $10 - b$ ) (Alex. 2016)
- ⑦ If  $Y + 10 = 10$ , then  $Y =$  ..... (100 or 10 or 1 or 0) (El-Gharbia 2016)
- ⑧ If  $y = 3x + 5$ , then the constant ..... (y or x or 3 or 5) (Ismailia 2016)
- ⑨ Shorouk saved  $x$  pounds, her father gave her 10 pounds, then she has ..... pounds  
( $10x$  or  $10 - x$  or  $x + 10$  or  $x - 10$ ) (Port Said 2016)
- ⑩ The perimeter of the equilateral triangle whose side length is  $y$  cm = .....  
( $3y$  or  $y + 3$  or  $y - 3$  or  $\frac{y}{3}$ ) (Qena 2015)
- ⑪ if  $y + 1 = 7$ , then  $y - 1 =$  ..... (3 or 5 or 6) (Alex. 2015)

### 2 Complete each of the following:

- ① Subtracting 5 from twice the number  $x$  is ..... (Behera 2015)
- ② The sum of two numbers is 21 one of them is  $x$ , then the other = ..... (Cairo 2016)
- ③ If  $5x - 7 = 33$ , then  $x =$  ..... (Giza 2016)
- ④ If  $3x = 21$ , then  $x =$  ..... (Ismailia. 2016)
- ⑤ If the number  $x$  is 9 more than double of  $y$ , then  $x =$  ..... (Damietta 2016)

- 6 If  $x - 3 = 5$ ,  $x \in \mathbb{N}$ , then  $x = \dots\dots\dots$  (Giza 2017)
- 7 If we add 5 to three times the number  $y$ , then we get the number  $\dots\dots\dots$  (Alex. 2016)
- 8 If  $b = 3$ , then  $2b - 5 = \dots\dots\dots$  (Menofia 2017)
- 9 Double the number  $x$  is added to 3 =  $\dots\dots\dots$  (South Sinai 2015)

### 3 Find the result:

- 1 Solve the equations:  
 a)  $x + 3 = 12$ ,  $x \in \mathbb{N}$       b)  $\frac{1}{3}x + 8 = 10$ ,  $x \in \mathbb{N}$  (Ismailia 2015)
- 2 Three times of a number  $x$  is 8 more than 1, express it in an equation and solve it. (Giza 2016)
- .....
- 3 Solve the equations:  
 a)  $2x + 3 = 13$       b)  $\frac{1}{2}y = 6$  (Ismailia 2016)
- 4 If the number  $x$  exceeds twice the number  $y$  by 9, write the mathematical relation between  $x$  and  $y$ . (Kafr-El Sheikh 2016)
- 5 Find the number which if added to 3, the sum will be 9. (Assuit 2016)



Assess your skills & solve Interactive Tests after each unit..

[www.aladwaa.com](http://www.aladwaa.com)



# UNIT TEST

(From the School Book)

# 2

on Unit

**1** Translate the verbal statements into symbolic expressions:

- a) 7 is added to the double of a number.  
b) 3 is subtracted from three times of a number.
- 

**2** Complete:

- a) The perimeter of a square whose side length is  $x$  = .....  
b) The perimeter of an equilateral triangle whose side length is  $l$  = .....  
c) The area of a rectangle whose length is  $x$  cm and width is 5 cm = .....
- 

**3** Solve the following equations:

- a)  $x + 5 = 7$   
b)  $y - 3 = 9$   
c)  $3 + x = 11$
- 

**4** Write down a real life situation that can be represented by the equation  $x + 5 = 12$ , then find  $x$ .

---

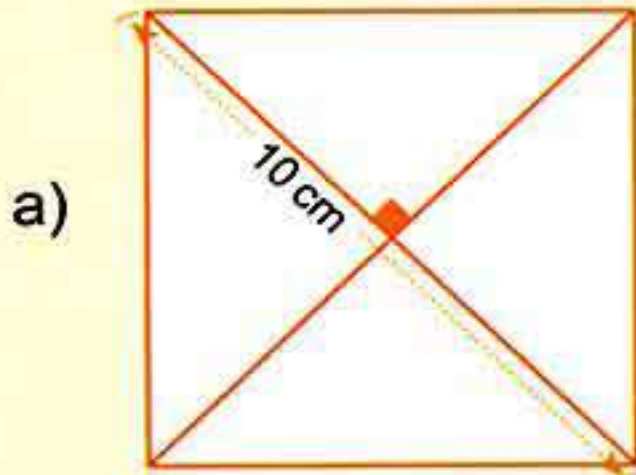
**5** Solve the following equation:

$$75 = 5x + 7 \times 10$$

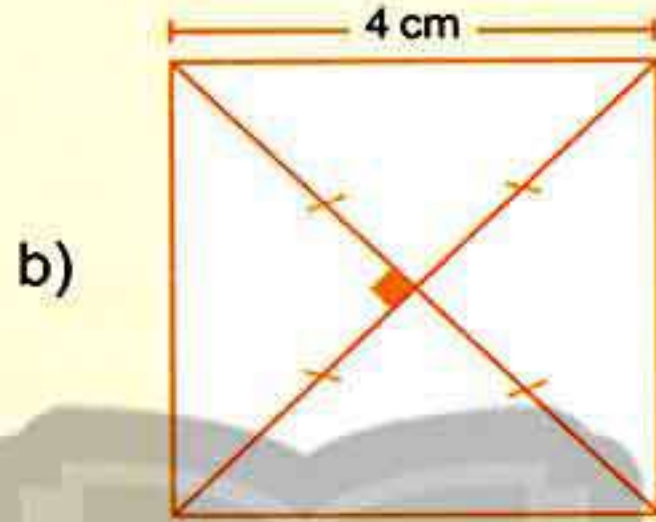
# EXERCISE 3

## Surface Area of a Square in terms of its Diagonal Lengths

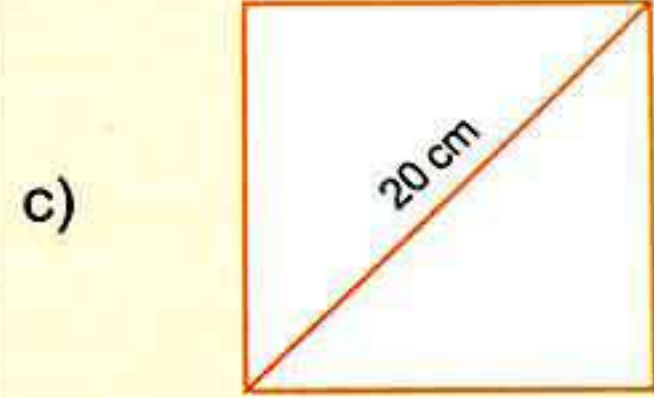
1 Find the area of each of the following squares:



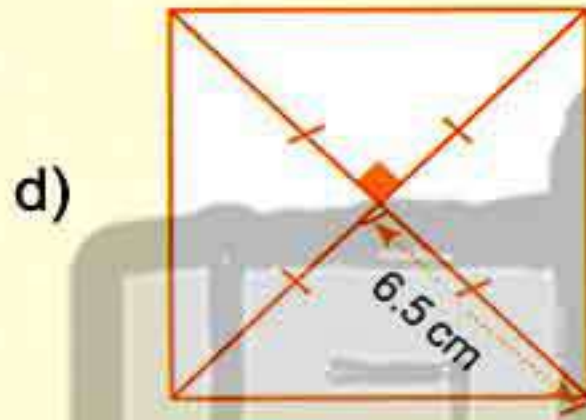
Area = ..... cm<sup>2</sup>.



Area = ..... cm<sup>2</sup>.



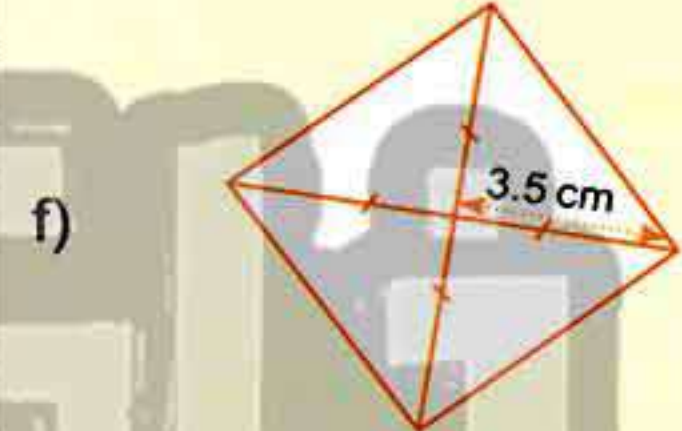
Area = ..... cm<sup>2</sup>.



Area = ..... cm<sup>2</sup>.



Area = ..... cm<sup>2</sup>.



Area = ..... cm<sup>2</sup>.

2 Complete each of the following:

a) The area of square =  $\frac{1}{2} \times \dots \times \dots$ .

b) The area of square = side length  $\times \dots$ .

c) The area of the square whose side length is 8 cm = ..... cm<sup>2</sup>.

d) The area of the square whose diagonal length is 10 dm = ..... dm<sup>2</sup>.

e) The area of the square whose side length is 2 dm = ..... cm<sup>2</sup>.

f) The area of the square whose diagonal length is 9 cm = ..... cm<sup>2</sup>.

g) A square of side length  $l$  cm, its area = ..... cm<sup>2</sup>.

**3** Calculate the area of each of the following:

- A square whose diagonal length is 12 cm.
- A square whose diagonal length is 3.5 cm
- A square whose side length is 0.4 m.
- A square in which half the length of its diagonal is 7.5 cm.

**4** Which is smaller in area: a square whose diagonal length is 2 dm, or a parallelogram with a base length of 18 cm and a height of 10 cm? Find the difference between the two areas.

**5** If the area of a square is  $25 \text{ cm}^2$ , find its side length and its perimeter.

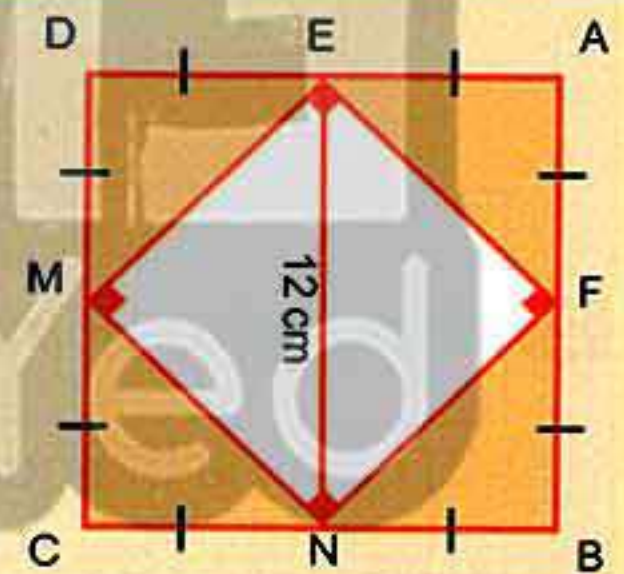
**6** If the perimeter of a square is 16 cm, find its area.

**7** If the area of a square is  $72 \text{ cm}^2$ , find its diagonal length.

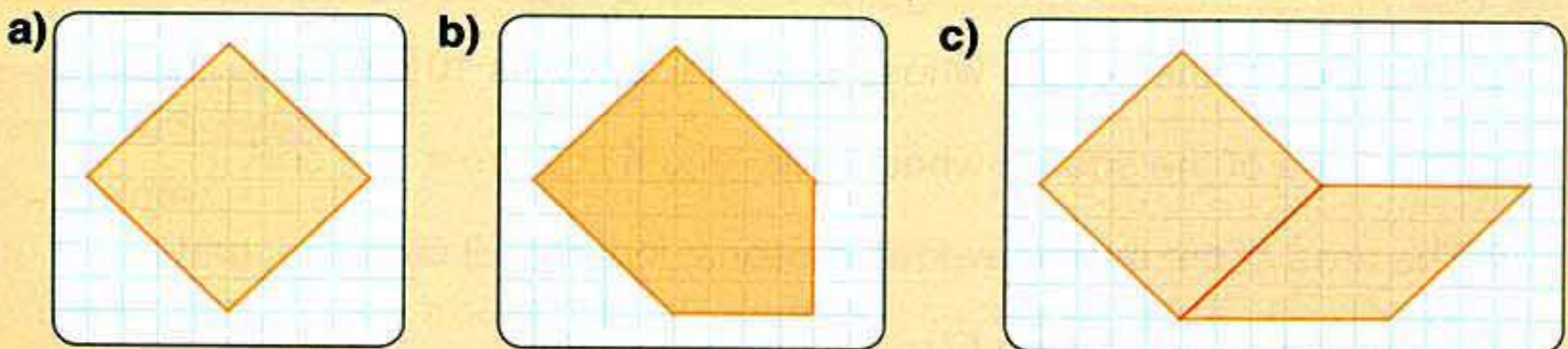
**8** In the opposite figure:

ABCD is a square, E, F, N and M are the midpoints of its sides and EFNM is a square, if  $EN = 12 \text{ cm}$ .

- Calculate the area of the shaded part.

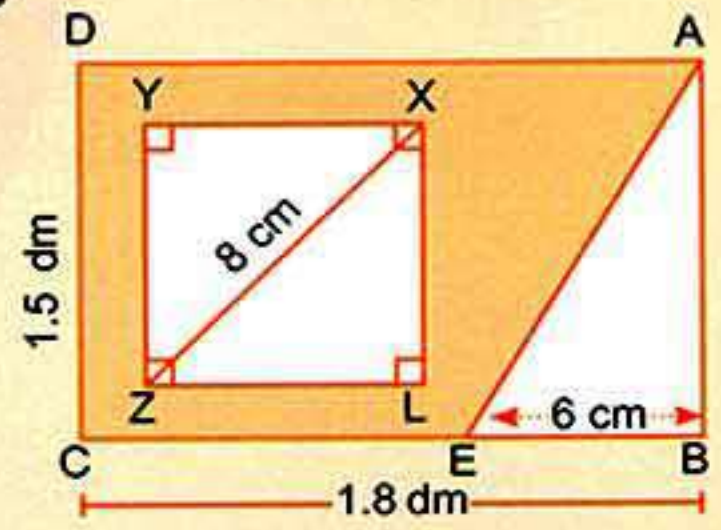


**9** Calculate the area of each of the following figures:

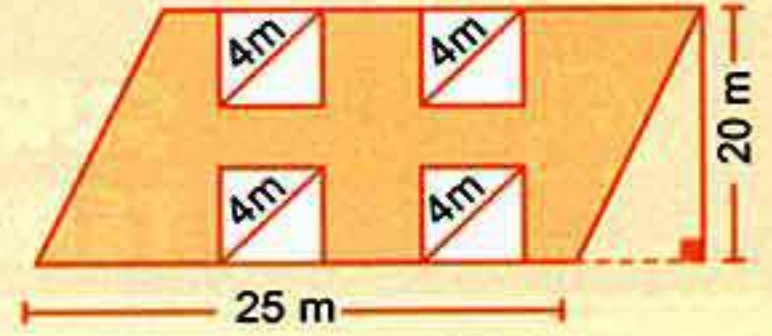




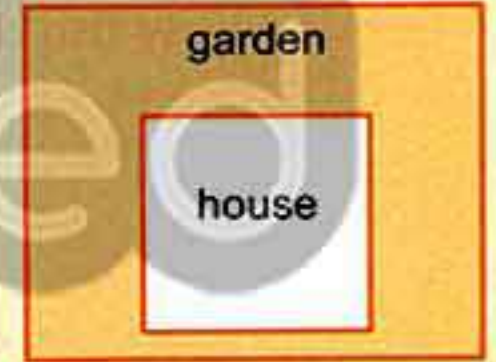
- 10 In the opposite figure: ABCD is a rectangle where  $BC = 1.8$  dm,  $DC = 1.5$  dm, XYZL is a square whose diagonal length = 8 cm, the point E is lying on  $\overline{BC}$ , such that  $BE = 6$  cm. Find the area of the shaded region.



- 11 The opposite figure shows a piece of land in the shape of a parallelogram, its base length is 25 m and its corresponding height is 20 m. Four congruent pieces each in the form of a square, whose diagonal is 4 m, were chosen to be used for storage purposes. Find the area of the remaining part of this land.

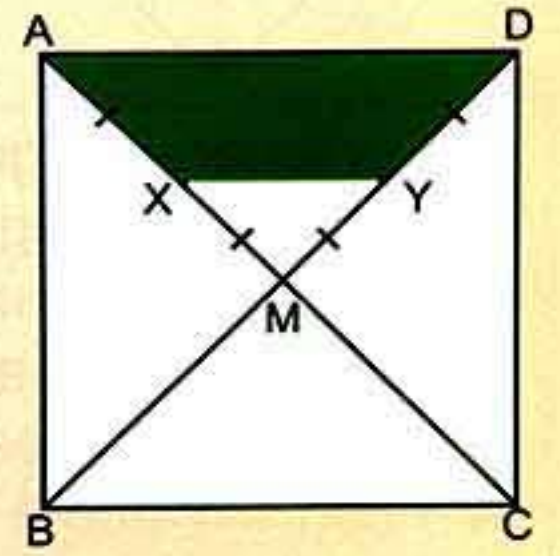


- 12 The area of piece of paper is  $312.5$  cm<sup>2</sup>. We cut from it 7 congruent squares each of diagonal length 9 cm. Find the area of the remaining part.
- 13 A square-shaped piece of land whose diagonal length is 28 metres. A square-shaped house of side length of 15 metres has been built on it, and the remaining part is planted as a garden. Find the area of this garden.



### FOR EXCELLENT PUPILS


- 14 In the opposite figure: ABCD is a square whose area equals  $72$  cm<sup>2</sup>. X is the midpoint of  $\overline{MA}$ , Y is the midpoint of  $\overline{MD}$ . Calculate the area of the shaded part.



## EXERCISE 4

Surface Area of a Rhombus  
in Terms of its Diagonal LengthsInteractive  
Exercise

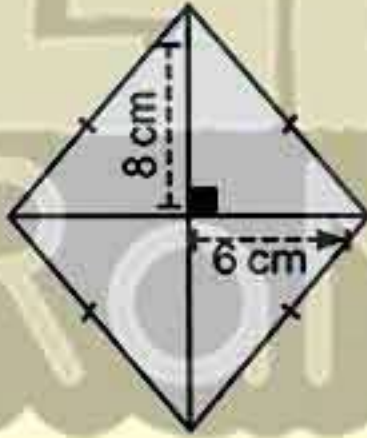
## 1 Complete each of the following:

- a) Area of a rhombus = side length  $\times$  .....
- b) Area of a rhombus =  $\frac{1}{2} \times$  .....
- c) If the diagonals lengths of a rhombus are 24 cm and 12 cm, then its area = .....  $\text{cm}^2$ .
- d) A rhombus with a side length of 14 cm and a height of 5 cm, its area = .....  $\text{cm}^2$ .
- e)  If the length of one diagonal in a rhombus is 8 cm and the area of the rhombus =  $36 \text{ cm}^2$ , then the length of the other diagonal = .....

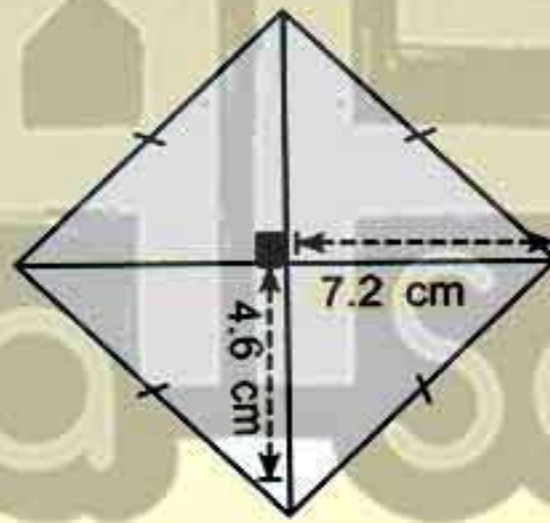
## 2 Calculate the area of each of the following figures:

**Tip:** from the data given you notice that there is a rhombus.

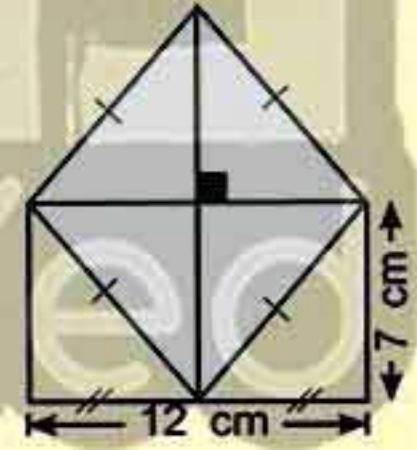
a)

Area = .....  $\text{cm}^2$ .

b)

Area = .....  $\text{cm}^2$ .

c)

Area = .....  $\text{cm}^2$ .

## 3 Observe the following figures, then complete the table below as the example (in Fig.(1)):

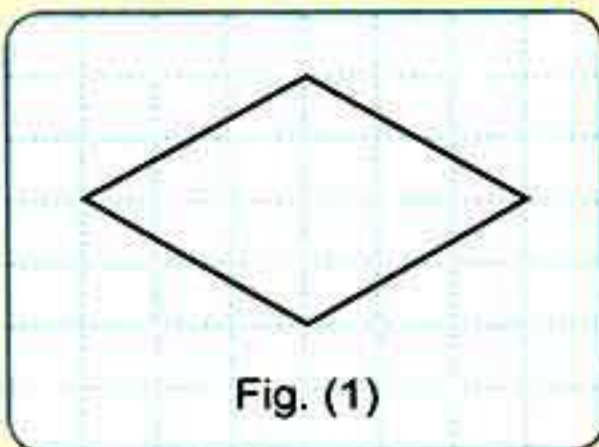


Fig. (1)

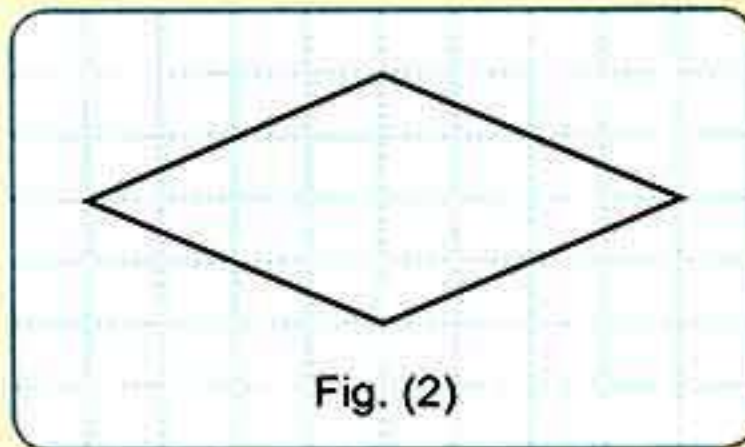


Fig. (2)

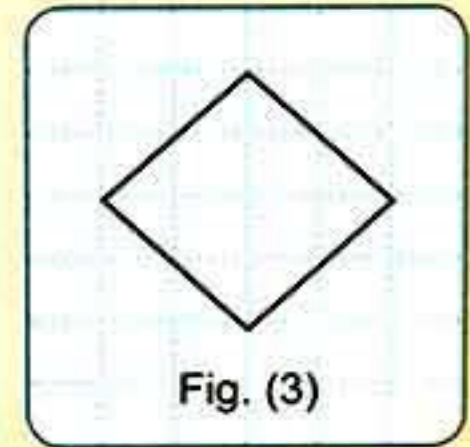
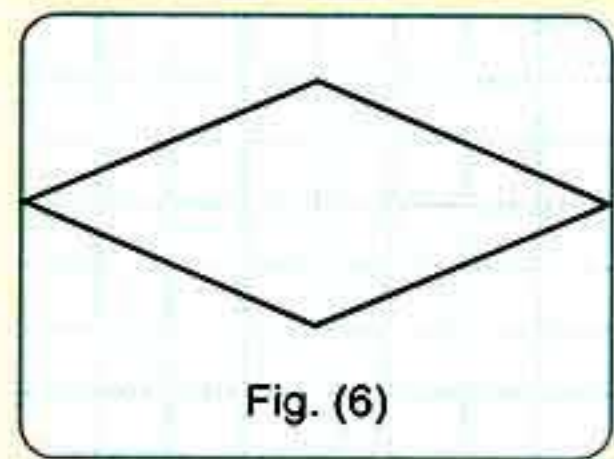
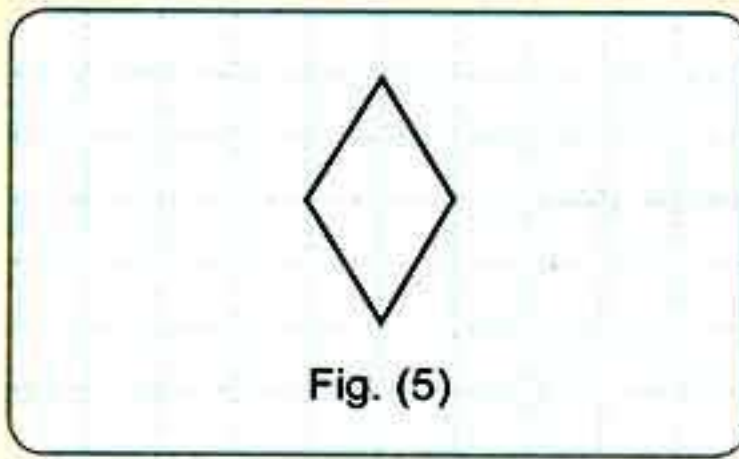
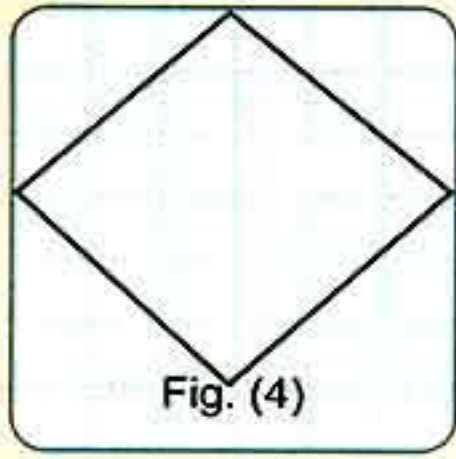


Fig. (3)

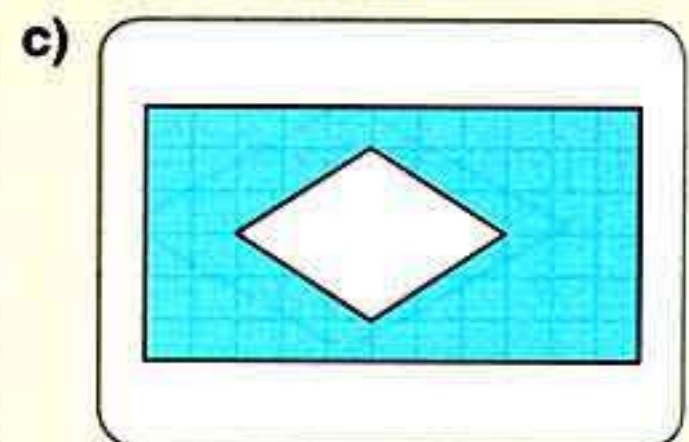
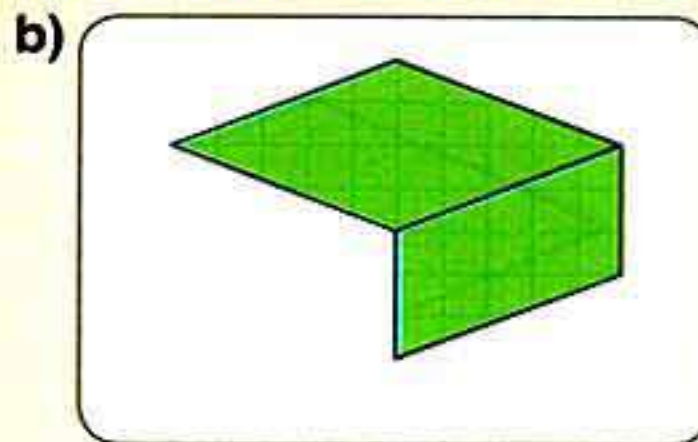
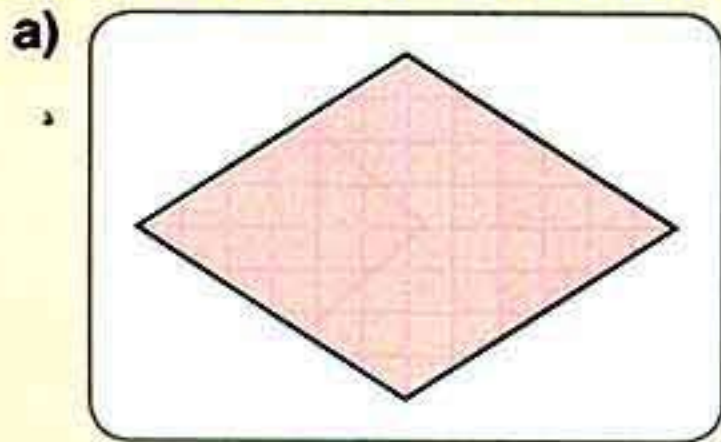


The figure number	The area in square units	The figure number	The area in square units
Ex. (1)	$\frac{1}{2} \times 4 \times 6 = 12$	(4)	$\frac{1}{2} \times \dots \times \dots = \dots$
(2)	$\frac{1}{2} \times \dots \times \dots = \dots$	(5)	$\frac{1}{2} \times \dots \times \dots = \dots$
(3)	$\frac{1}{2} \times \dots \times \dots = \dots$	(6)	$\frac{1}{2} \times \dots \times \dots = \dots$

4 Complete the following table:

	Diagonal length of rhombus	The other diagonal length of rhombus	The area of the rhombus in square units
a)	3 cm	5.4 cm	..... cm <sup>2</sup>
b)	2.3 cm	.....	4.6 cm <sup>2</sup>
c)	24 mm	3 cm	..... mm <sup>2</sup>
d)	27 cm	..... dm	8.1 dm <sup>2</sup>
e)	1.7 m	..... cm	3.4 m <sup>2</sup>

5 Calculate the area of each of the following coloured regions:



6 If the perimeter of a rhombus is 20 cm and its height is 3.5 cm, find its area.

7 Which is greater in area?

A parallelogram with a base length of 10 cm and the corresponding height of 5 cm or a rhombus whose diagonal lengths are 8 cm and 6 cm. Then calculate the difference between their areas.

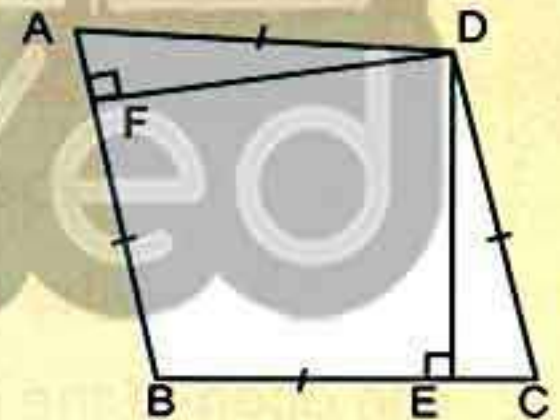
8 Which figure has the greater area: a parallelogram with a base length of 5.4 cm and the corresponding height of 4.1 cm or a rhombus with diagonal lengths of 5.4 cm and 4.1 cm?

9 A rhombus whose diagonal lengths are 7 cm and 9 cm. Find its area and if its height is 5 cm, find its side length.

10 A rhombus with a side length of 8 cm and a height of 6.75 cm, if the length of one of its diagonals = 9 cm, find the length of the other diagonal.

11 In the opposite figure, ABCD is a rhombus with a side length of 10 cm and diagonal lengths of 16 and 12 cm, find:

- The area of the rhombus ABCD.
- The length of each of  $\overline{DE}$  and  $\overline{DF}$ . What can you say about the heights of the rhombus?



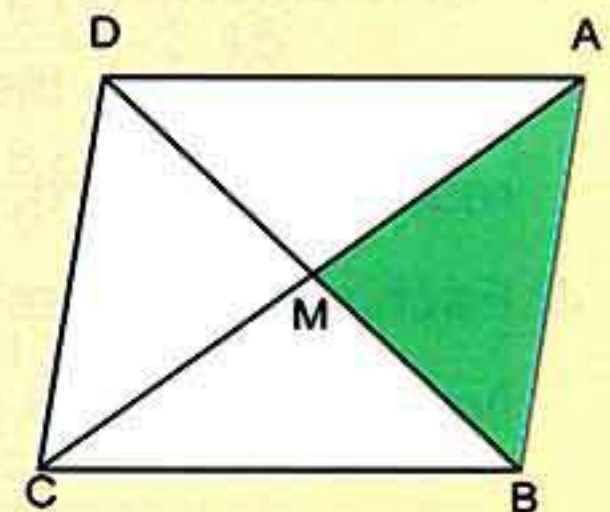
### FOR EXCELLENT PUPILS

12 In the opposite figure:

ABCD is a rhombus, the area of  $\triangle AMB = 24 \text{ cm}^2$ ,

$AC = 16 \text{ cm}$  and  $BC = 10 \text{ cm}$ . Calculate:

- The length of each of  $\overline{BD}$
- The height of the rhombus.





## EXERCISE 5

## The Circumference of a Circle



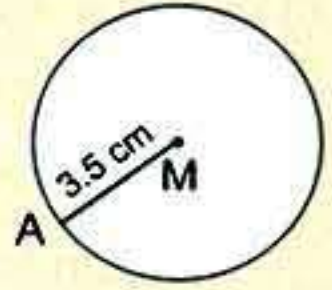
Interactive Exercise

## 1 Complete the following:

a) The circumference of a circle =  $2 \times \pi \times \dots\dots\dots$  or  $\pi \times \dots\dots\dots$ 

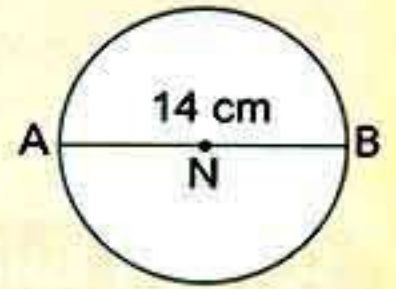

b) From the opposite figure:

Circle M, its radius length = 3.5

its circumference =  $\dots\dots\dots$  cm. ( $\pi \approx \frac{22}{7}$ )

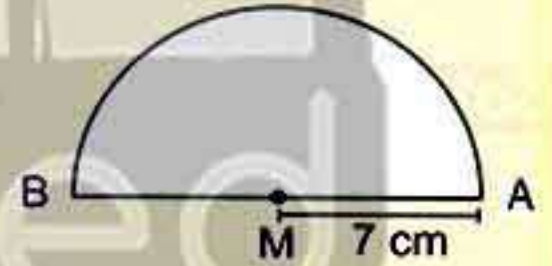
c) From the opposite figure:

Circle N, its diameter length = 14 cm

its circumference =  $\dots\dots\dots$  cm. ( $\pi \approx \frac{22}{7}$ )d)  The circumference of a circle of diameter length 14 cm =  $\dots\dots\dots$  cm. ( $\pi \approx \frac{22}{7}$ )e) A circle with a circumference of 66 cm, its diameter length =  $\dots\dots\dots$  cm. ( $\pi \approx 3.14$ )f) A circle with a circumference of  $20\pi$  cm, its radius length =  $\dots\dots\dots$  cm.

g) In the opposite figure M is the centre of a circle, MA = 7 cm,

then the perimeter of the figure:

=  $\dots\dots\dots$  cm. ( $\pi \approx \frac{22}{7}$ )

## 2 Complete the following table:

	Radius length	Diameter length	$\pi$	Circumference
a)	7 cm	$\dots\dots\dots$ cm	$\frac{22}{7}$	$\dots\dots\dots$ cm
b)	$\dots\dots\dots$ cm	20 cm	3.14	$\dots\dots\dots$ cm
c)	$\dots\dots\dots$ cm	$\dots\dots\dots$ cm	3.14	75.36 cm
d)	$\dots\dots\dots$ cm	98 cm	$\frac{22}{7}$	$\dots\dots\dots$ mm

3 Find the circumference of each of the following circles whose radii lengths are: ( $\pi \approx \frac{22}{7}$ )

a) 14 cm

b)  $10\frac{1}{2}$  cm

c) 3.5 cm

d) 49 cm

4 Find the circumference of each of the following circles whose diameters lengths are: ( $\pi \approx 3.14$ )

a) 10 cm

b) 100 cm

c) 50 cm

5 Calculate the circumference of a circle whose diameter length is 15.4 cm to the nearest hundredths: ( $\pi \approx 3.14$ )

6 Find the radius length of each of the following circles whose circumferences are: ( $\pi \approx \frac{22}{7}$ )

a) 88 cm

b) 11 cm

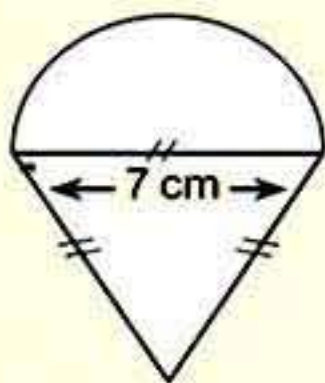
c) 66 cm

7 A cylindrical jar of jam, its base is in the shape of a circle whose radius length is 3.5 cm. Find the circumference of the base of this jar. ( $\pi \approx \frac{22}{7}$ )

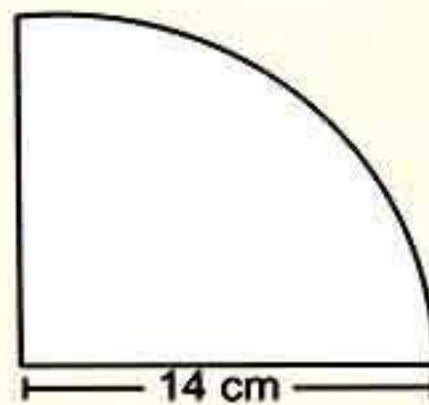


8 Find the perimeter of each of the following figures: ( $\pi \approx \frac{22}{7}$ )

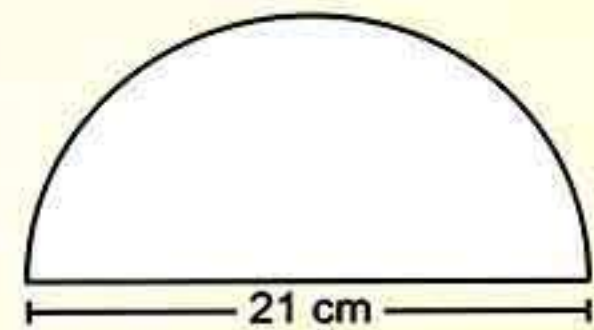
a)



b)

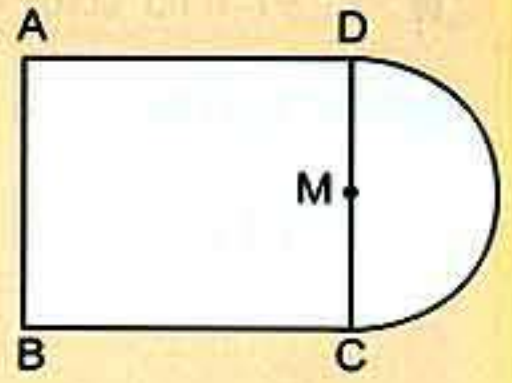


c)

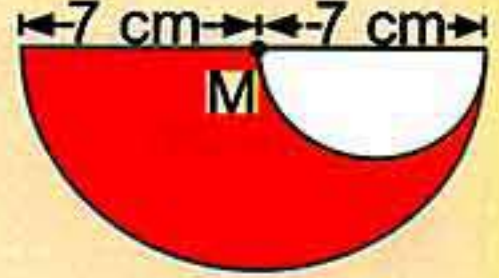


**9 Complete each of the following:**

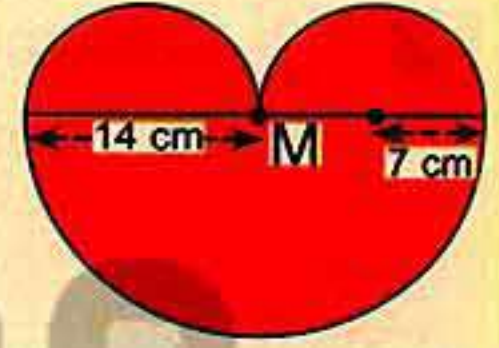
a) If ABCD is a square of side length 7 cm, then the perimeter of the opposite figure = ..... cm ( $\pi \approx \frac{22}{7}$ ).  
(40 or 37 or 32 or 21)



b) The perimeter of the colored part = ..... cm ( $\pi \approx \frac{22}{7}$ ).  
(39 or 40 or 33 or 36)

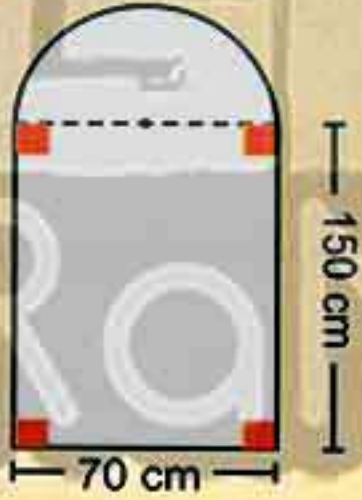


c) The perimeter of the opposite figure = ..... cm ( $\pi \approx \frac{22}{7}$ ).  
(66 or 44 or 22 or 88)



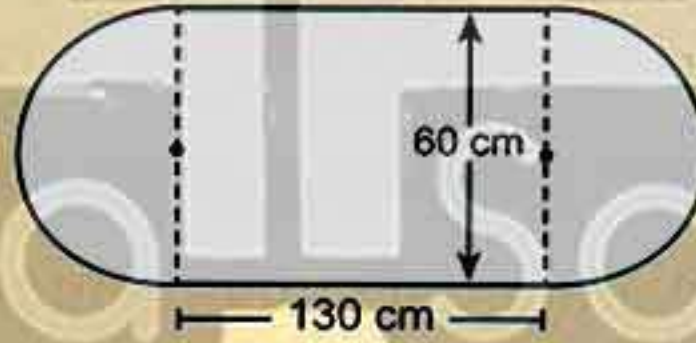
**10 Calculate the circumference of each figure: ( $\pi \approx 3.14$ )**

a)



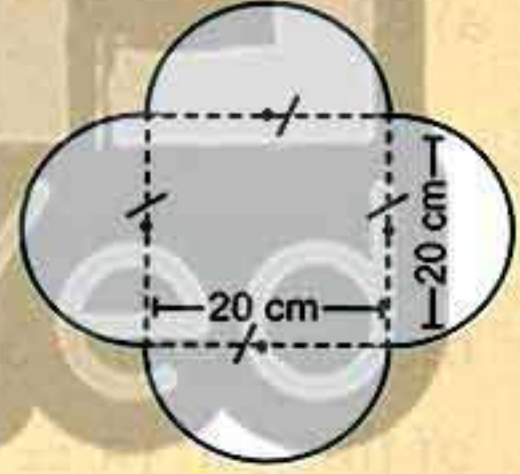
.....  
.....

b)



.....  
.....

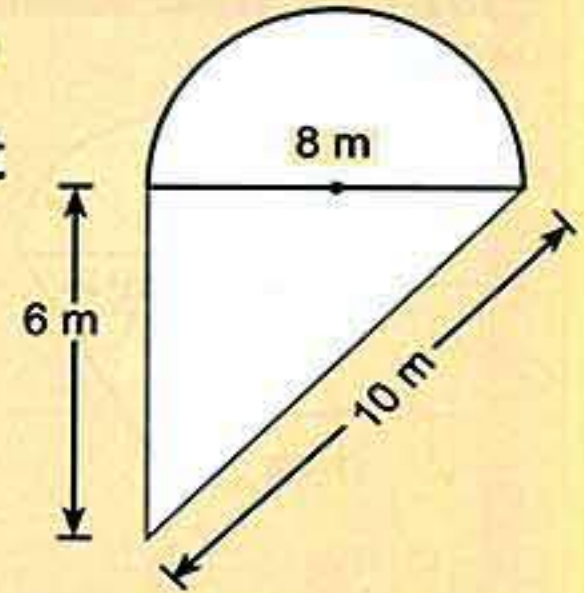
c)




.....  
.....


**11** The opposite figure represents a garden. We want to make a fence around this garden. If one metre of that fence costs 20 pounds, **find:**

- a) The perimeter of the garden ( $\pi \approx 3.14$ ).
- b) The cost of the fence.



- 12  If the diameter length of a bike's wheel is 66 cm. What is the covered distance if the wheels turn 1000 rounds? ( $\pi \approx 3.14$ )



- 13  A rectangular piece of paper whose dimensions are 22 cm and 10 cm is needed to be put on the surface area of a curved cylindrical shape such that  $\overline{AB}$  is coincident on  $\overline{CD}$ ,

complete:

the height of the tin = ..... cm,

the circumference of the base = ..... cm.

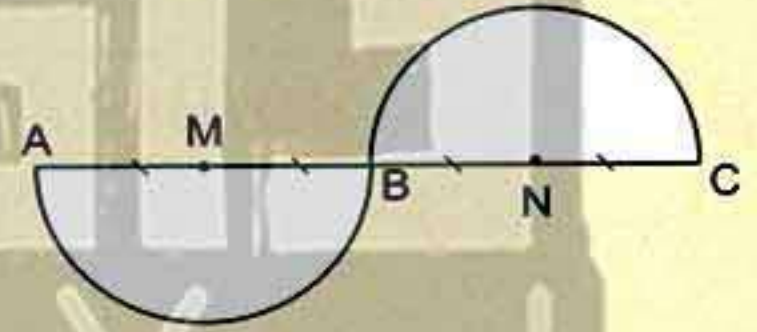
Find the radius length of its base. ( $\pi \approx \frac{22}{7}$ )



- 14 *In the opposite figure:*

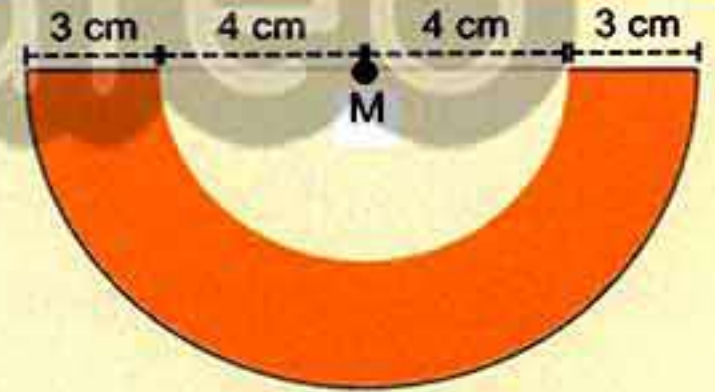
If  $AM = MB = BN = NC = 14$  cm,

find the perimeter of the opposite figure ( $\pi \approx \frac{22}{7}$ ).

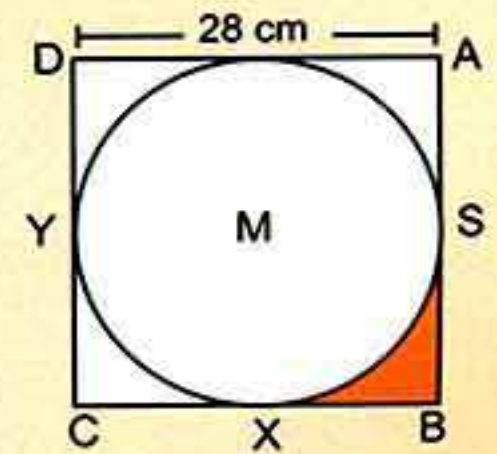


- 15 *In the opposite figure:*

Calculate the perimeter of the coloured part. ( $\pi \approx \frac{22}{7}$ ).



- 16 ABCD is a square whose side length is 28 cm, A circle M touches its four sides internally. Find the perimeter of the shaded part.

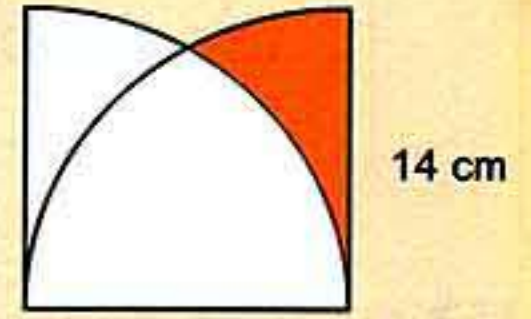




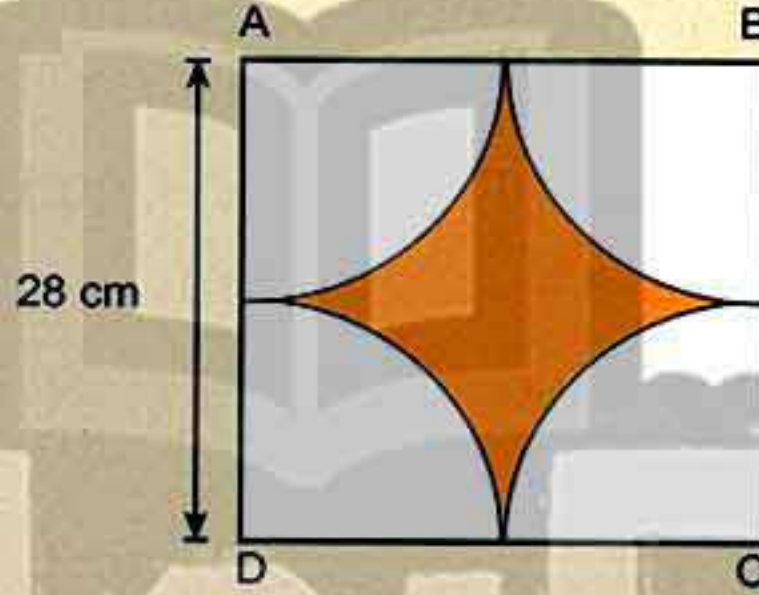


## FOR EXCELLENT PUPILS

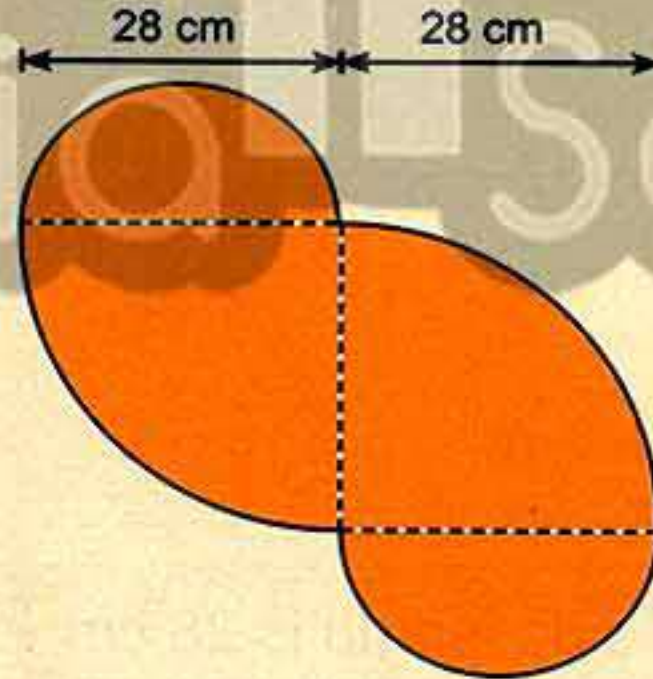
- 17 The opposite figure represents two congruent quarters of a circle, find the perimeter of the shaded part.



- 18 Find the perimeter of the shaded part of the following figure if ABCD is a square:



- 19 Find the perimeter of the shaded part of the following figure:



where  $(\pi \approx \frac{22}{7})$

## EXERCISE 1

Symmetrical Figures and Axis of Symmetry -  
Geometric Transformations and Reflection

1 Complete by writing the type of the geometric transformations (reflection or rotation or translation):

(In case of reflection draw the line of reflection)

a)



.....

b)



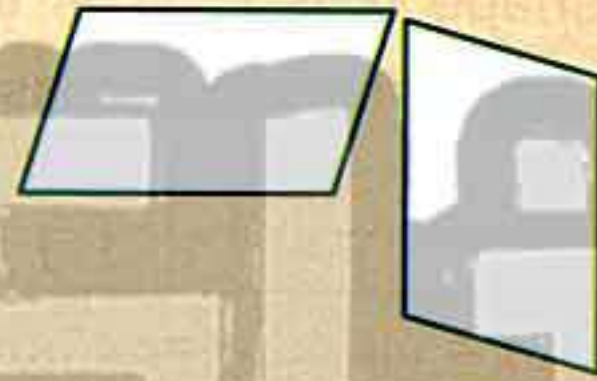
.....

c)



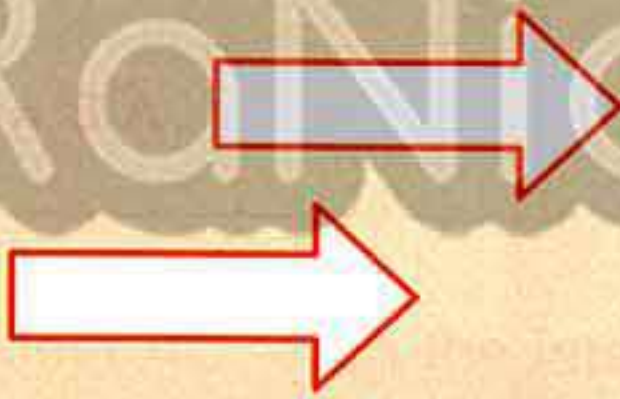
.....

d)



.....

e)



.....

f)



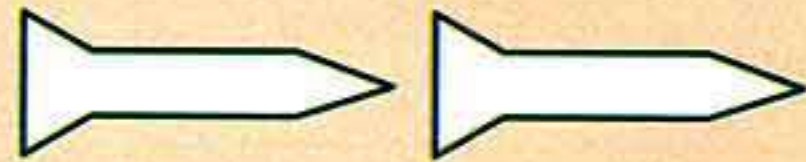
.....

g)



.....

h)



.....

## 2 Put (✓) or (X) :

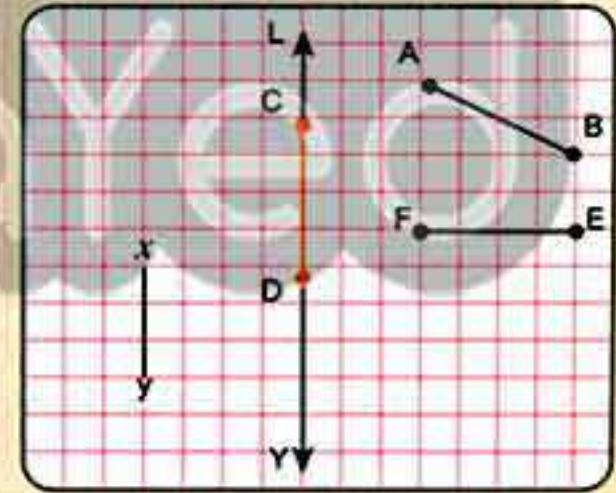
- a) Scalene triangle has one line of symmetry. ( )  
 b) A parallelogram has 3 lines of symmetry. ( )  
 c) A rectangle has only one symmetry line. ( )  
 d) A rhombus has four lines of symmetry. ( )  
 e) A square has four lines of symmetry. ( )  
 f) A line of symmetry of any geometrical figure divides it into two congruent parts. ( )  
 g) The image of any point lies on the line of reflection is itself. ( )

## 3 Choose the correct answer:

- a) The number of lines of symmetry of trapezium = ..... (1 or 2 or 0 or 4)  
 b) The number of lines of symmetry of an equilateral triangle = .....  
 (1 or 2 or 3 or 4)  
 c) The number of lines of symmetry of a rhombus = ..... (1 or 2 or 3 or 4)  
 d) The number of lines of symmetry of a square = ..... (1 or 2 or 3 or 4)  
 e) The number of lines of symmetry of an isosceles triangle = .....  
 (1 or 2 or 3 or 4)  
 f) The number of lines of symmetry of a regular hexagon = .....  
 (1 or 2 or 4 or 6)

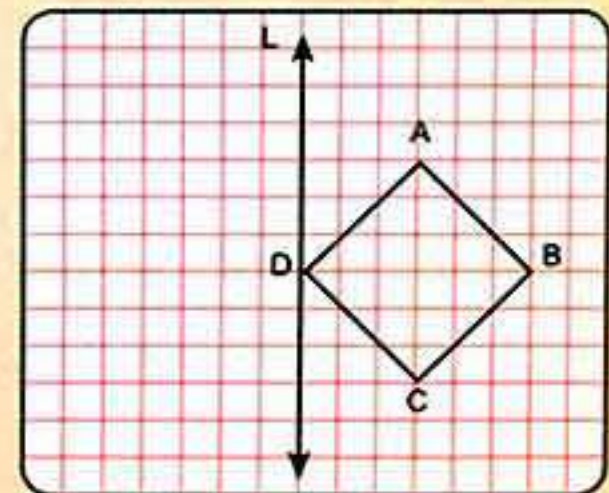
## 4 Find the images of the indicated line segments by reflection across L, then complete:


- a) The image of  $\overline{AB}$  by reflection across L is .....  
 b) The image of  $\overline{EF}$  by reflection across L is .....  
 c) The image of  $\overline{XY}$  by reflection across L is .....  
 d) The image of  $\overline{CD}$  by reflection across L is .....



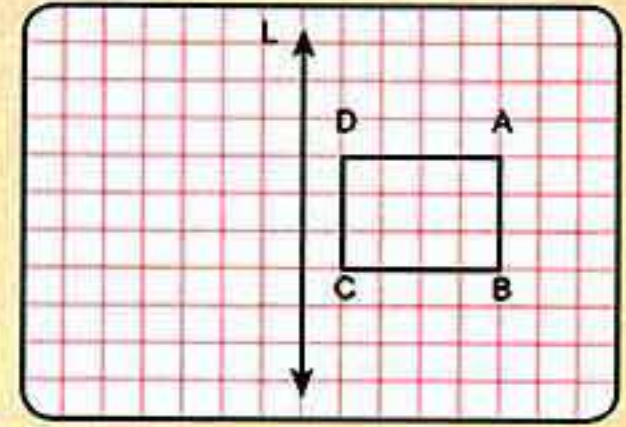
## 5 Find the image of the square ABCD by reflection across L:


- Locate point A' the image of A  
 Locate point B' the image of B  
 Locate point C' the image of C  
 Locate point D' the image of D  
 Then the image of square ABCD is .....



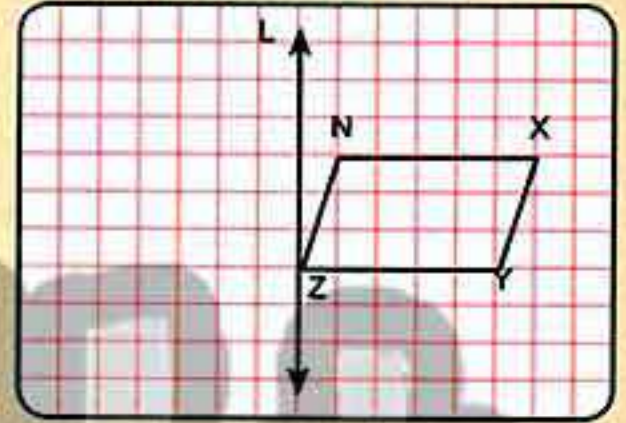
6  In the following figure: Find the image of the rectangle ABCD by reflection across  $L$ , then complete:

- a) The image of the rectangle ABCD by reflection across  $L$  is the rectangle .....
- b)  $BC = \dots\dots\dots$ , and  $m(\angle D) = \dots\dots\dots$

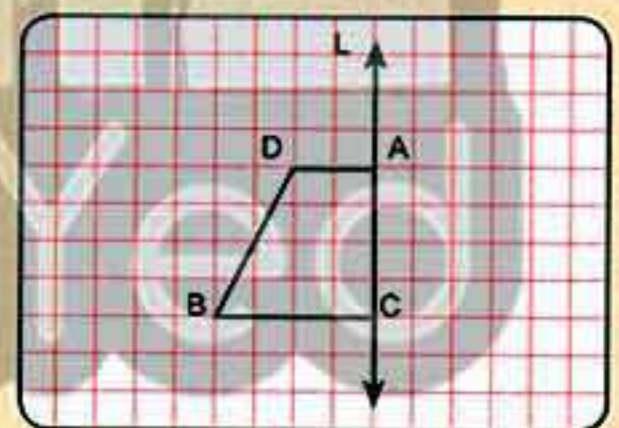
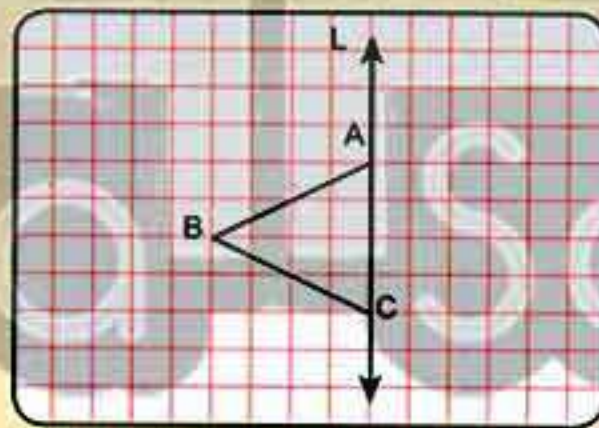
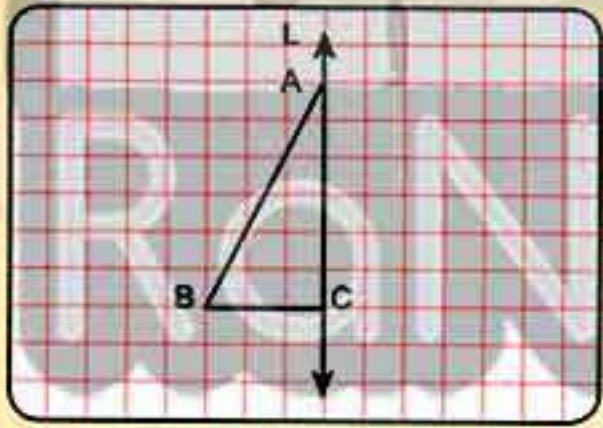


7  In the following figure: Find the image of the parallelogram XYZN by reflection across  $L$ , then complete:

- a) The image of the parallelogram XYZN by reflection across  $L$  is the parallelogram .....
- b)  $XY = \dots\dots\dots$ , and  $YZ = \dots\dots\dots$



8 Determine the image of each figure by reflection across  $L$ :

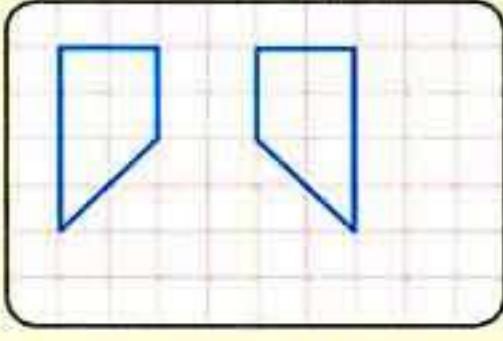


According to the previous figures, complete:

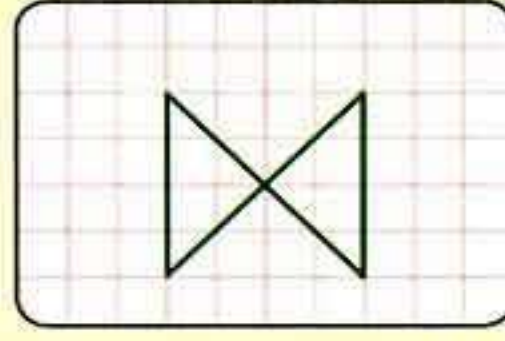
- a) Each figure and its image are .....
- b) The image of point A is ..... because it lies on .....
- c) The image of point C is ..... because it lies on .....
- d) If the paper (where the figure is drawn on) is folded along the line of reflection  $L$ , then the figure coincides with .....

9 In each figure draw the reflection axis to make one figure as an image for the other:

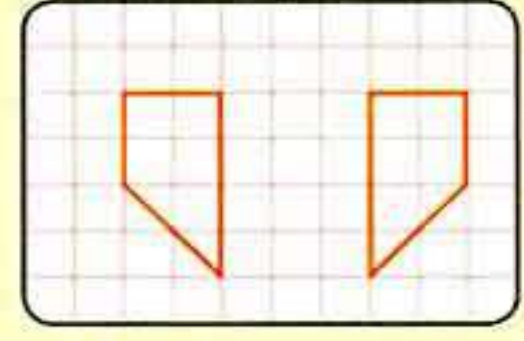
a)



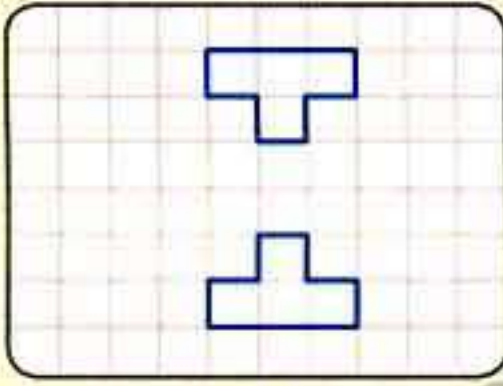
b)



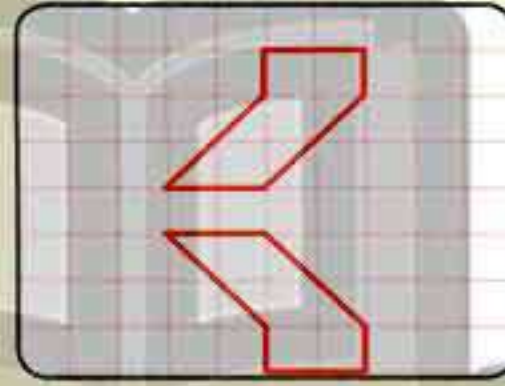
c)



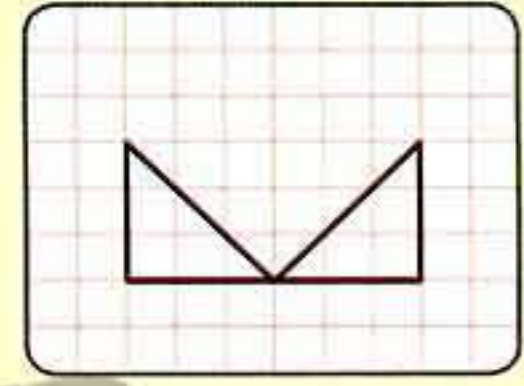
d)



e)

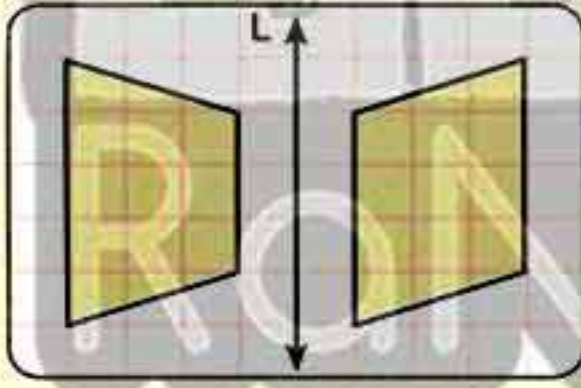


f)

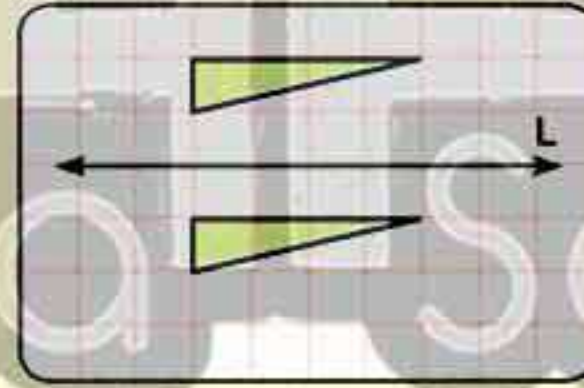


10 Which one is a reflection for the other across L?

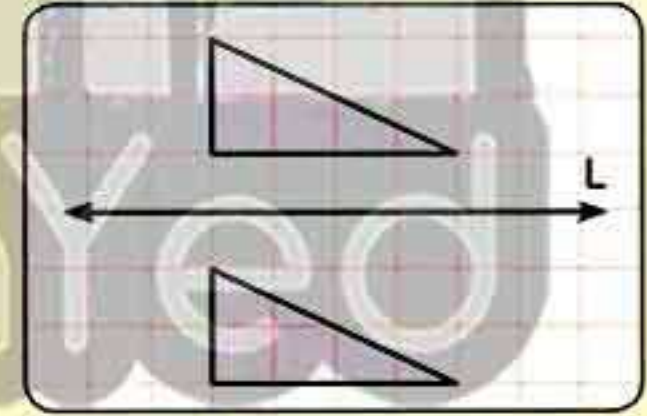
a)



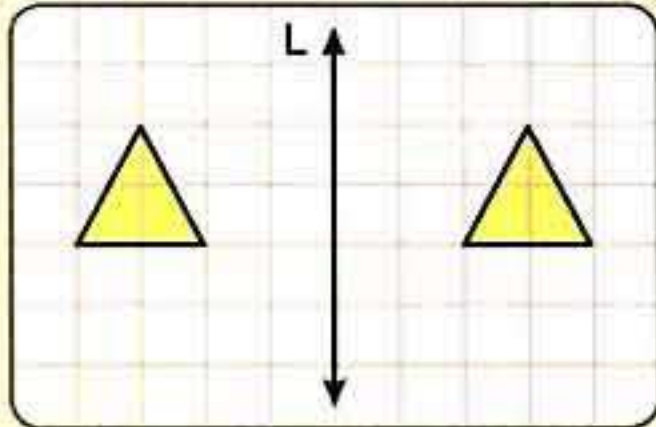
b)



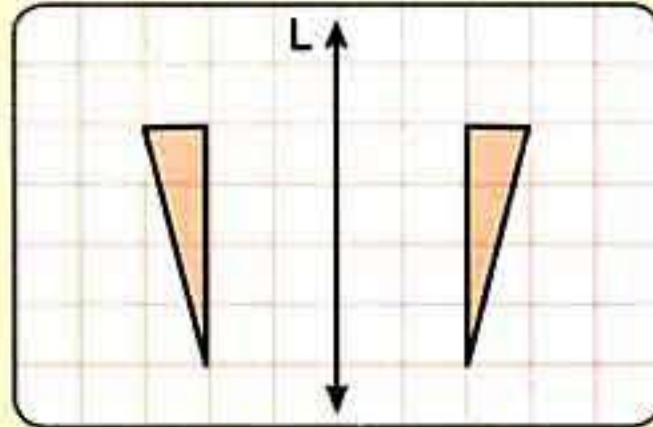
c)



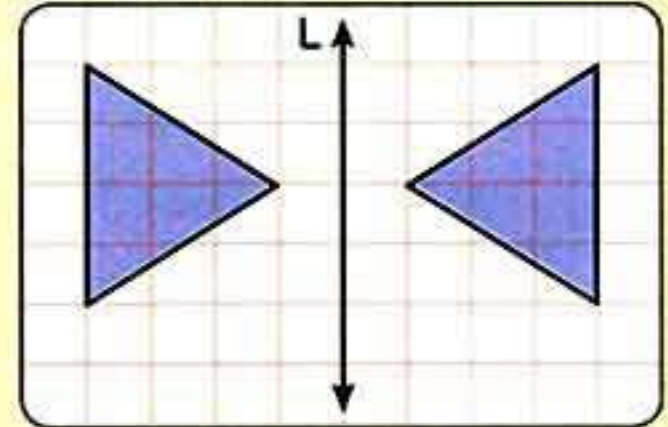
d)



e)

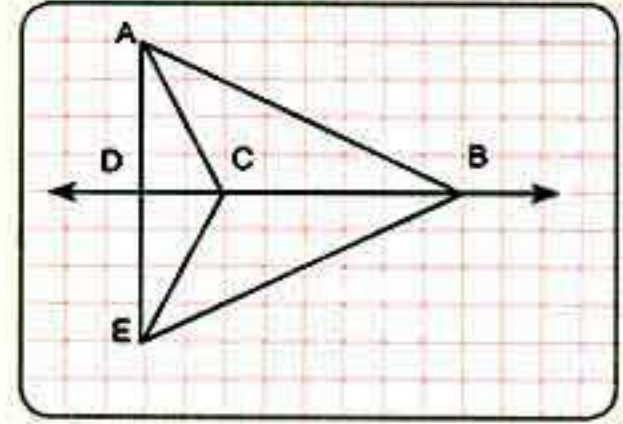


f)


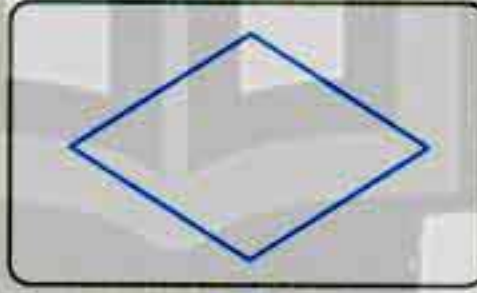
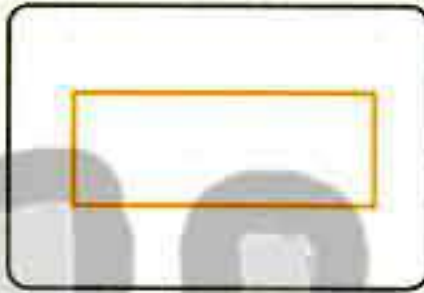


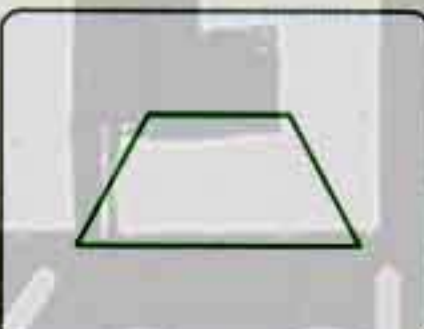
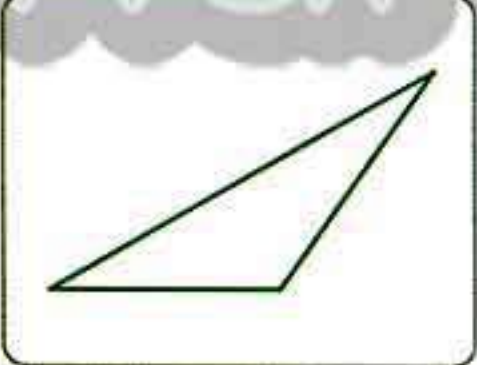

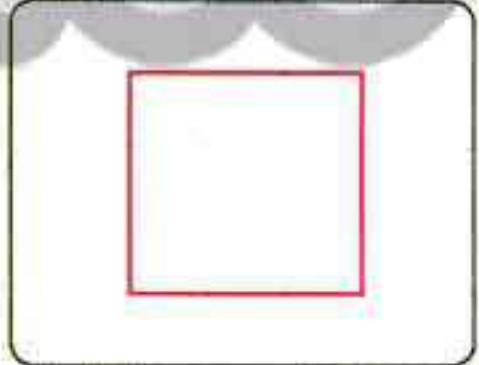
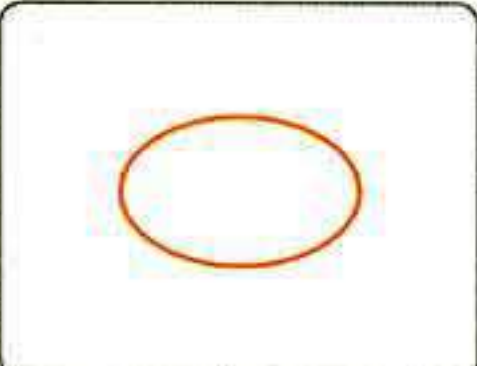
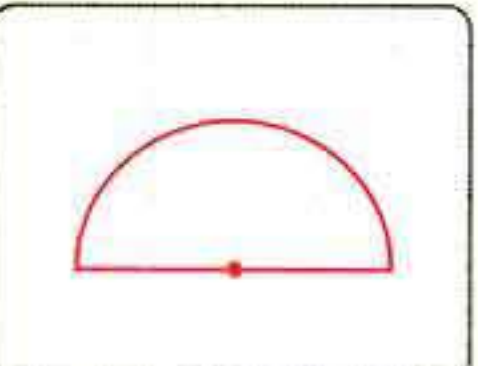
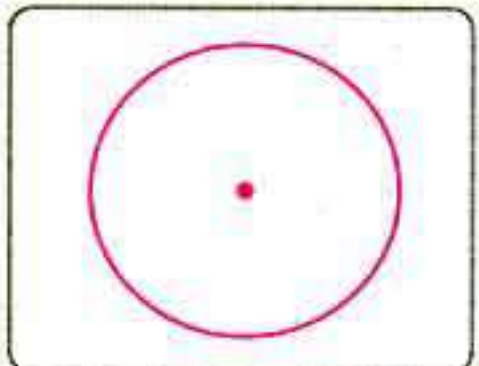


11 In the following figure,  $\overleftrightarrow{BD}$  is the axis of reflection, complete:

- a) The image of  $\triangle ABC$  by reflection across  $\overleftrightarrow{BD}$  is ....., then  $AB = \dots\dots\dots$  and  $AC = \dots\dots\dots$
- b) The image of  $\triangle ACD$  by reflection across  $\overleftrightarrow{BD}$  is ....., then  $AD = \dots\dots\dots$  and  $\overline{CD}$  coincides with .....
- c)  $\triangle ABC$  is congruent to  $\triangle \dots\dots\dots$  and  $\triangle ACD$  is congruent to  $\triangle \dots\dots\dots$



12 Draw the line of symmetry for each figure: (If it exists)

a) 	b) 	c) 
d) 	e) 	f) 
g) 	h) 	i) 
j) 	k) 	l) 

13 From the opposite figure:

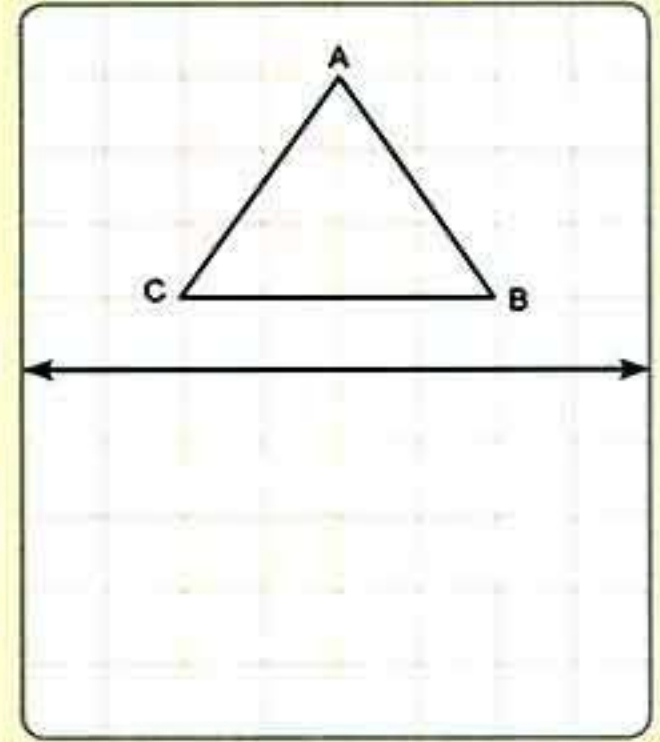
a) Find the image of  $\triangle ABC$  across the line L.

b) If the image of  $\triangle ABC$  across L is  $\triangle A'B'C'$ ,

then complete:

- The line of symmetry of  $\triangle ABC$  is  $\longleftrightarrow$  .....

- The line of symmetry of  $\triangle A'B'C'$  is  $\longleftrightarrow$  .....



### FOR EXCELLENT PUPILS

14 In the following figure: complete each of the following and write the reason:

a)  $\triangle BEF$  is the image of  $\triangle AEF$  by reflection across  $\longleftrightarrow$  .....

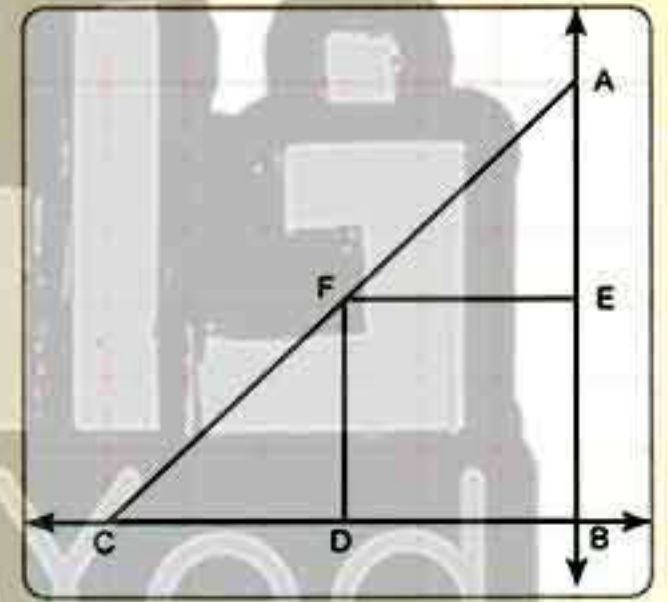
because .....

b)  $\triangle ABF$  is the image of  $\triangle CBF$  by reflection across  $\longleftrightarrow$  .....

because .....

c)  $\triangle AEF$  is the image of  $\triangle CDF$  by reflection across  $\longleftrightarrow$  .....

because .....



**Tip:** If you join  $\overline{BF}$ , you will find  $\overline{BF} \perp \overline{AC}$ . Why?



Assess your skills & solve Interactive Exercises after each lesson..

[www.aladwaa.com](http://www.aladwaa.com)

## Worksheet

## 4

## till Lesson (4) - Unit (1)

20

5

## 1 Complete each of the following:

- a)  $35 + 15 = 15 + 35$  (..... property)
- b) The additive neutral element is .....
- c)  $(46 + 19) + 8 = 46 + (19 + 8)$  (..... property)
- d)  $4 + \dots = 4$
- e)  $\{0, 1, 2\} \cap \mathbb{E} = \dots$

## 2 Choose the correct answer:

- a)  $3.4 \dots \mathbb{N}$  ( $\in, \notin, \subset$  or  $\emptyset$ )
- b)  $(3 - 4) \dots \mathbb{N}$  ( $\in, \notin, \subset$  or  $\emptyset$ )
- c) The smallest natural number is ..... ( $\frac{1}{2}, \frac{1}{4}, 0$  or  $1$ )
- d) The sum of any two odd numbers is ..... (odd, even, prime or nothing)
- e)  $7 \times 15 = 15 \times x$ , then  $x = \dots$  ( $7, 15, 35$  or  $105$ )

3 Use the properties of addition in  $\mathbb{N}$  to carry out each of the following:

- a)  $638 + 145 + 362 + 155$
- b)  $257 + 71 + 49$
- c)  $753 + 972 + 247$
- d)  $47 + 215 + 53 + 85$

## 4 Arrange ascendingly the results of each of the following:

$$(7 \times 10), (35 - 0), (178 - 170), (2 \times 3) \times 5$$





## Worksheet

6

till Lesson (6) - Unit (1)

20

5

## 1 Complete each of the following:

- a) 1, 4, 9, 16, ..... in the same pattern.
- b) The set of natural numbers greater than 5 is .....
- c) Odd number  $\times$  odd number = ..... number
- d) If  $9 \times 18 = x \times 9$ , then  $x =$  .....
- e)  $5 \times \dots = 0$

## 2 Choose the correct answer:

- a) The next number in the pattern 200, 185, 170 is .....  
(175, 165, 155 or 145)
- b) ..... is not a natural number. (0, 1, 2 or  $\frac{1}{2}$ )
- c)  $(7 - 10) \dots \mathbb{N}$  ( $\in$ ,  $\notin$ ,  $\subset$  or  $\supset$ )
- d)  $\{0, 1.72, 2, 3\} \dots \mathbb{N}$  ( $\in$ ,  $\notin$ ,  $\subset$  or  $\supset$ )
- e)  $66 \dots \mathbb{N}$  ( $\in$ ,  $\notin$ ,  $\subset$  or  $\supset$ )

3 a) If  $a = 1$ ,  $b = 12$ ,  $c = 3$ , find the value of:

1)  $a \times b + b \times c$

2)  $(b \div c) \times a$

## b) Arrange the following results descendingly:

$(5 \times 12) \div 20$  ,  $(7 \times 0 + 8 \times 2)$  ,  $(5 \times 6 - 5 \times 5)$  and  $(7 \times 9)$

## 4 a) Represent each of the following sets on the number line:

X = the set of natural numbers greater than 3.

Y = the set of natural numbers between 1 and 10.

- b) Complete in the same pattern:  $\circ$   $\circ\circ$   $\circ\circ\circ$   
 $\circ$  ,  $\circ\circ$  ,  $\circ\circ\circ$  , ..... , .....

## Unit (2)

Worksheet

till Lesson (1) - Unit (2)

25

5

## 1 Complete each of the following:

- a) The perimeter of the rectangle whose dimensions are  $3x$ ,  $2y$  cm = .....
- b) The perimeter of the rhombus whose side length is  $l$  = .....
- c)  $a(b + \dots) = \dots \times \dots + \dots \times c$  (..... property)
- d) 1, 1, 2, 3, 5, ....., ....., ..... in the same pattern.
- e) The symbolic expression for "Adding 3 to the number  $x$ " is .....

## 2 Choose the correct answer:

- a) Subtracting 4 from the double of the number  $a$  = .....  
(  $a - 4$ ,  $4 - a$ ,  $2a - 4$  or  $4a - 2$  )
- b) The next number in the pattern 1, 3, 9, 27, ..... ( 30 , 33 , 36 or 81 )
- c) If the difference between two numbers is 5 and the smaller is  $y$ , then the greater is .....  
(  $y$  ,  $y + 5$  ,  $y - 5$  or 5 )
- d)  $14 \div 3$  .....  $\mathbb{N}$  (  $\in$  ,  $\notin$  ,  $\subset$  or  $\supset$  )
- e)  $\mathbb{N} \cap \mathbb{C} =$  ..... (  $\{0\}$  ,  $\emptyset$  ,  $\mathbb{E}$  or  $\mathbb{C}$  )

## 3 Write the symbolic expression of each of the following:

- a) Adding 1 to three times of the number  $x$ .
- b) Subtracting 5 from half of the number  $y$ .
- c) Multiplying 9 by the number  $Z$ , then adding the result to 6.

4 a) If  $a = 3$  ,  $b = 5$  ,  $c = 4$ , calculate the value of  $(a \times c - b) \times (c - a)$ 

b) Arrange the following results ascendingly:

$$6 \times 10 , 15 - 0 , 125 - 125 \text{ and } (8 \times 4) \times 2$$

5 If  $U = \{x : x \in \mathbb{N}, x \leq 6\}$ ,  $X = \{x : x \in \mathbb{N}, x \text{ is a prime number less than } 7\}$ ,

$$Y = \{3, 5, 6\}$$

Find: a) By listing method  $U$  ,  $X$ .b) Venn diagram for  $U$ ,  $X$ ,  $Y$ c)  $X - Y$ d)  $X^c$ 

12

GEM / MATH / Primary 5

## Worksheet 8

## till Lesson (2) - Unit (2)

25

5

## 1 Complete each of the following:

- a) If the price of a book is LE. 10 and  $y$  is the total price of  $x$  books, then  $y = \dots\dots\dots$
- b) In the mathematical relation  $a = b + 5$ , the constant is  $\dots\dots\dots$
- c) 1, 4, 8, 13,  $\dots\dots\dots$  in the same pattern.
- d) If  $x$  is an odd number, then  $(x + 1)$  is an  $\dots\dots\dots$  number.

## 2 Choose the correct answer:

- a)  $(0 - 7) \dots\dots\dots \mathbb{N}$  ( $\in, \notin, \subset$  or  $\emptyset$ )
- b) Subtracting 3 from twice the number  $x = \dots\dots\dots$  ( $3 - x, 3x, 2x - 3$  or  $3 - 2x$ )
- c) If the sum of the two numbers  $x, y$  is 20, then  $y = \dots\dots\dots$  ( $20 + x, 20 - x, x - 20$  or  $\frac{x}{20}$ )
- d) If the side length of an equilateral triangle is  $l$  and its perimeter is  $P$ , then  $P = \dots\dots\dots$  ( $3l, l + 3, l - 3$  or  $\frac{l}{3}$ )

3 If  $y = 3x$  is the mathematical relation between  $x$  and  $y$ , then complete the table:

$x$	2	5	$\dots\dots\dots$	$\dots\dots\dots$	$\dots\dots\dots$	3
$y$	$\dots\dots\dots$	$\dots\dots\dots$	18	3	30	$\dots\dots\dots$

## 4 Use the properties of addition and multiplication to find the result of each of the following:

- a)  $192 + 488 + 308 + 12$
- b)  $17 \times 55 + 45 \times 17$
- c)  $54 \times 99$
- d)  $27 \times 101$

5 Reem bought  $x$  kg of bananas and put them in a bag that costs L.E. 2, calculate what Reem should pay in terms of  $x$  and what she should pay if the price of 1 kg of bananas is L.E. 10.

## Worksheet 9

## till Lesson (3) - Unit (2)

25

4

## 1 Complete each of the following:

- a) The smallest number in  $\mathbb{N}$  is .....
- b) If  $x - 1 = 9$ ,  $x \in \mathbb{N}$ , then  $x =$  .....
- c)  $(219 + 19) + \dots = 219 + (19 + 199)$
- d) If  $X = \{x : x \in \mathbb{N}, 0 \leq x \leq 3\}$ , then  $X =$  .....

2 a) If  $x$  is an even number between 3 and 8, write the values of  $x$ .b) Find the value of  $x$  in each of the following:

1)  $22 + x = 9 + 22$

2)  $7x = 117 \times 7$

## c) Solve each of the following equations:

1)  $x - 5 = 13$

2)  $2x + 4 = 14$

3 a) Using the distributive property, find the product of  $572 \times 99$ .b) If  $x$  is a natural number, its three times exceeds the multiplicative neutral element by 8.Express this situation by an equation and find the value of  $x$ .

## 4 a) Using natural operations properties, find the value of each of the following:

1)  $57 + 56 + 43$

2)  $431 \times 499 + 431 \times 501$

b) Write by the listing method  $X = \{x : x \in \mathbb{N}, 0 \leq x \leq 8\}$  and represent it on the number line.5 a) If  $a = 1$ ,  $b = 2$  and  $c = 3$ , calculate the value of:  $5 \times a + 8 \times b - 2 \times c$ b) If  $643 = x + (4 \times 10) + (6 \times 100)$ , then find the value of  $x$ .

## Unit 2

## Test (1)



## 1 Choose the correct answer:

- 1) If  $x + 2 = 6$ , then  $x = \dots\dots\dots$  (3 or 5 or 4 or 6)
- 2) Subtracting 3 from the double of the number  $x = \dots\dots\dots$  ( $x - 3$  or  $2x - 3$  or  $3x + 2$  or  $5x$ )
- 3) If  $2x = 12$ , then  $x = \dots\dots\dots$  (2 or 5 or 6 or 7)
- 4) Subtracting 4 from the number  $y$ , the symbolic expression is  $\dots\dots\dots$   
( $2y - 4$  or  $y + 4$  or  $y - 4$  or  $2y + 4$ )
- 5) Adding 5 to the double of the number  $x = \dots\dots\dots$  ( $x - 5$  or  $x + 5$  or  $5 + 2x$  or  $5 - 2x$ )
- 6) If a man's age now is  $x$  years old, then his age after 4 years will be  $\dots\dots\dots$   
( $x + 4$  or  $x - 4$  or  $2x + 3$  or  $3x - 3$ )
- 7) Subtracting "1" from three times the number  $x$  is  $\dots\dots\dots$   
( $3x$  or  $3x - 1$  or  $3x + 1$  or  $1 - 3x$ )
- 8) If  $x = 2$  and  $y = 3$ , then  $5xy = \dots\dots\dots$  (100 or 110 or 130 or 30)
- 9) The sum of two numbers A and B is 10, then  $B = \dots\dots\dots$   
( $A - 10$  or  $10A$  or  $10 - A$  or  $A + 10$ )

## 2 Complete the following:

- 10) If  $5 + x = 14$ , then  $x = \dots\dots\dots$
- 11) 7 is subtracted from twice the number  $y = \dots\dots\dots$  (in symbolic expression)
- 12) If we add 3 to the number  $x$ , then we will get the number  $\dots\dots\dots$
- 13) If  $y = 3$ , then  $3y - 5 = \dots\dots\dots$

## 3 Find the result:

- 14) Solve the equation:  $2x + 9 = 21$ ,  $x \in \mathbb{N}$
- 15) Solve the equation:  $2x - 5 = 3$  where  $x \in \mathbb{N}$
- 16) Solve the equation in  $\mathbb{N}$ :  $\frac{1}{2}x - 5 = 3$
- 17) Solve the equation in  $\mathbb{N}$ :  $\frac{1}{2}y = 6$

## Unit 2

## Test (2)



## 1 Choose the correct answer:

- 1) Subtracting 7 from the double of the number  $x = \dots\dots\dots$  ( $x - 7$  or  $2x - 7$  or  $7x + 2$  or  $14x$ )
- 2) If  $x + 8 = 15$ , then  $x = \dots\dots\dots$  . (3 or 7 or 6 or 5)
- 3) 3 subtracted from twice the number  $x = \dots\dots\dots$  ( $x - 3$  or  $2x + 3$  or  $2x - 3$  or  $3 - 2x$ )
- 4) The perimeter of the square whose side length is  $x = \dots\dots\dots$   
( $4x$  or  $x + 4$  or  $\frac{x}{4}$  or  $x - 4$ )
- 5) 6 added to the number  $y$  is  $\dots\dots\dots$  . (6y or  $y + 6$  or  $y - 6$  or  $\frac{y}{6}$ )
- 6) The difference between two numbers is 5, if the smaller one is  $y$ , then the greater number is  $\dots\dots\dots$  . (5y or  $5 - y$  or  $y - 5$  or  $y + 5$ )
- 7) The perimeter of the equilateral triangle whose side length is  $L$  cm is  $\dots\dots\dots$  cm.  
( $L + 3$  or  $\frac{1}{3}L$  or  $L - 3$  or  $3L$ )

## 2 Complete the following:

- 8) The perimeter of a rectangle is 20 cm. If its length is  $x$ , then its width is  $\dots\dots\dots$
- 9) If  $y - 3 = 15$  where  $y \in \mathbb{N}$ , then  $y = \dots\dots\dots$  .
- 10) If  $5x = 35$ ,  $x \in \mathbb{N}$ , then  $x = \dots\dots\dots$
- 11) If we subtract 5 from  $x$ , we get  $\dots\dots\dots$
- 12) Twice the number  $x$  is  $\dots\dots\dots$
- 13) If the perimeter of an equilateral triangle is  $L$ , then its side length =  $\dots\dots\dots$
- 14) The sum of the two numbers  $x$  and  $y$  is 8, then the relation between  $x$  and  $y$  is  $\dots\dots\dots$  .

## 3 Find the result:

- 15) If the number  $x$  exceeds twice the number  $y$  by 9, write the mathematical relation between  $x$  and  $y$ .
- 16) Solve the equation:  $2x - 1 = 3$  in  $\mathbb{N}$ .
- 17) If  $y = x + 5$ , write the constant and the variable.
- 18) Solve the equation:  $3x + 7 = 19$ ,  $x \in \mathbb{N}$
- 19) Solve the equation:  $\frac{1}{2}x - 1 = 9$ ,  $x \in \mathbb{N}$

Worksheet **12** till Lesson (3) - Unit (3)

.....  
25  
.....  
5

**1** Complete each of the following:

- a) The area of square =  $\frac{1}{2}$  diagonal length  $\times$  .....
- b)  $154 + 39 = 39 + 154$  ( ..... property)
- c) The area of the square whose diagonal length is 6 cm = .....  $\text{cm}^2$ .
- d)  $2 \times 3, 3 \times 4, 4 \times 5, \dots$  (in the same pattern)
- e) The area of the parallelogram whose base length is 15 cm and its height is 1 dm = .....  $\text{cm}^2$

**2** Choose the correct answer:

.....  
5

- a)  $\mathbb{N} - \mathbb{C} = \dots$  ( $\mathbb{N}, \mathbb{C}, \emptyset$  or  $\{0\}$ )
- b) The area of the square whose side length is 10 cm = .....  $\text{cm}^2$  (20, 40, 50 or 100)
- c) The area of the rectangle whose length is 10 cm and width is 8 cm = .....  $\text{cm}^2$  (18, 36, 40 or 80)
- d) If  $78 = 8 + x \times 10$ , then  $x = \dots$  (7, 8, 10 or 70)
- e) The diagonal length of the square whose area is  $8 \text{ cm}^2 = \dots$  cm (2, 4, 32 or 64)

**3** Which is smaller in area?

.....  
5

The square whose diagonal length is 14 cm or the right-angled triangle in which the lengths of the sides of the right angle are 16 cm and 12 cm.

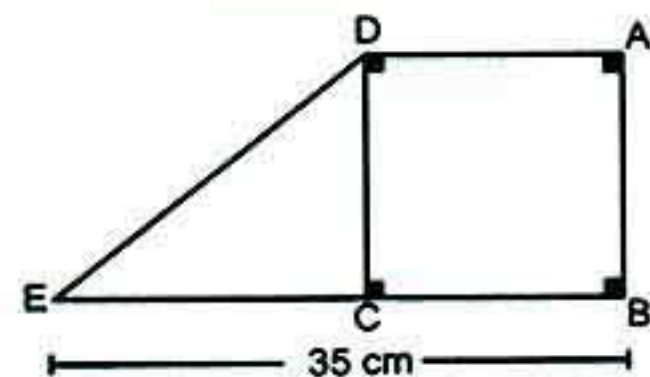
**4** a) Solve the equation:  $5x - 7 = 33$ 

.....  
5

- b) Using the commutative and associative properties, find the value of:  
 $725 + 368 + 275 + 632$

**5** In the opposite figure:

ABCD is a square whose perimeter is 60 cm,  
 $E \in \overrightarrow{BC}$  and  $BE = 35$  cm.  
Find the area of the figure ABED.



.....  
5



## Worksheet

## 13

## till Lesson (4) - Unit (3)

20

5

## 1 Complete each of the following:

- a) The triangle whose area is  $20 \text{ cm}^2$  and its base length =  $8 \text{ cm}$ , then its height = .....  $\text{cm}$
- b) The rhombus, the lengths of its diagonals are  $10 \text{ cm}$  and  $20 \text{ cm}$ , then its area = .....  $\text{cm}^2$
- c)  $32, 16, 8, 4, \dots, \dots$  (in the same pattern)
- d) The square whose diagonal length is  $12 \text{ cm}$ , its area = .....  $\text{cm}^2$
- e) The perimeter of the rhombus whose side length is  $x \text{ cm}$  = .....  $\text{cm}$

## 2 Choose the correct answer:

- a) A triangle, the length of its base is  $5 \text{ cm}$  and its height is  $6 \text{ cm}$ , then its area = .....  $\text{cm}^2$   
(  $15, 25, 30$  or  $36$  )
- b) Twice the number  $x$  divided by  $3$  = .....  $\text{cm}$  (  $\frac{3}{2x}, \frac{x}{3}, \frac{2x}{3}$  or  $6x$  )
- c) A rhombus, the lengths of its diagonals are  $15.6 \text{ cm}$ , and  $20 \text{ cm}$ , then its area = .....  $\text{cm}^2$   
(  $200, 156, 100$  or  $50$  )
- d) The rhombus whose area is  $20 \text{ cm}^2$  and the length of one of its diagonals =  $5 \text{ cm}$ , then the length of the other diagonal = .....  $\text{cm}$  (  $4, 8, 50$  or  $100$  )
- e) The parallelogram in which the length of its base is  $10 \text{ cm}$  and its height is  $5 \text{ cm}$ , then its area = .....  $\text{cm}^2$  (  $2, 25, 40$  or  $50$  )

- 3 a) ABCD is a rhombus whose perimeter is  $40 \text{ cm}$ , and the lengths of its diagonals are  $12 \text{ cm}$  and  $16 \text{ cm}$ . Find: The height of the rhombus.

b) Solve:  $5x - 4 = 26, \quad x \in \mathbb{N}$

- 4 A rhombus with an area of  $60 \text{ cm}^2$ . If the length of one of its diagonals is  $12 \text{ cm}$ , find the length of the other diagonal.

## Worksheet 14 till Lesson (5) - Unit (3)

25

5

## 1 Choose the correct answer:

- a) The area of the square whose diagonal length is 6 cm = ..... cm<sup>2</sup> (36 , 18 , 12 or 6)
- b) If  $x + 4 = 9$  ,  $x \in \mathbb{N}$  , then  $x =$  ..... (13 , 9 , 5 or 4)
- c) The circle whose diameter length is 14 cm, then its circumference = ..... cm ( $\pi \approx \frac{22}{7}$ )  
(22 , 28 , 44 or 66)
- d) Adding 7 to double of  $x =$  ..... ( $x + 7$  ,  $7x + 2$  ,  $2x + 7$  or  $x - 7$ )
- e) The next number in the pattern 5, 35, 65 is ..... (70 , 95 , 105 or 115)

## 2 Complete each of the following:

5

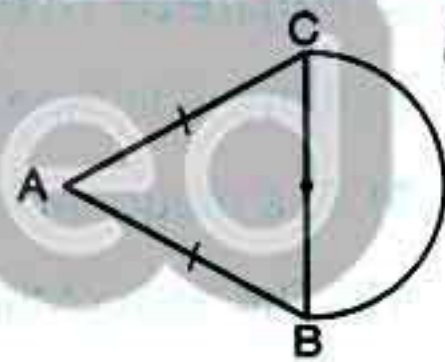
- a) The rhombus whose area is 32 cm<sup>2</sup> and side length is 8 cm, then its height = ..... cm.
- b) If  $x = 3$ , then the value of  $3x + 5 =$  .....
- c)  $\frac{\text{circumference}}{\text{diameter length}} =$  .....
- d) A square with area 12.5 cm<sup>2</sup>, then its diagonal length = ..... cm
- e) The circumference of the circle whose radius length is 10.5 cm = ..... cm ( $\pi \approx \frac{22}{7}$ )

## 3 In the opposite figure:

$\overline{BC}$  is a diameter whose length is 7 cm,  $AC = AB = 6$  cm.

Calculate the perimeter of the opposite figure.

( $\pi \approx \frac{22}{7}$ )



5

- 4 a) The circumference of a circle = 88 cm, find its radius length. ( $\pi \approx \frac{22}{7}$ )
- b) If the area of the square whose diagonal length is 12 cm equals the area of the parallelogram whose base length is 9 cm, find the height of the parallelogram corresponding to this base.

- 5 a) Express in words the mathematical relation  $a + b = 11$ , then find the value of  $b$  when  $a = 7$ .

- b) If the wheel's diameter length of a bicycle is 70 cm, what is the distance that the bicycle covers if the wheels turn 1500 rounds? ( $\pi = \frac{22}{7}$ )

## Unit (4)

Worksheet

15

till Lesson (1) - Unit (4)

20

1 Choose the correct answer:

5

- a) The number of lines of symmetry of a square is ..... (1, 2, 3 or 4)
- b) The number of lines of symmetry of an isosceles trapezium is ..... (1, 2, 4 or 6)
- c) The number of lines of symmetry of a scalene triangle is ..... (1, 0, 2 or 6)
- d)  $(72 + 9) \dots\dots\dots \mathbb{N}$  ( $\in$  or  $\notin$  or  $\subset$  or  $\not\subset$ )

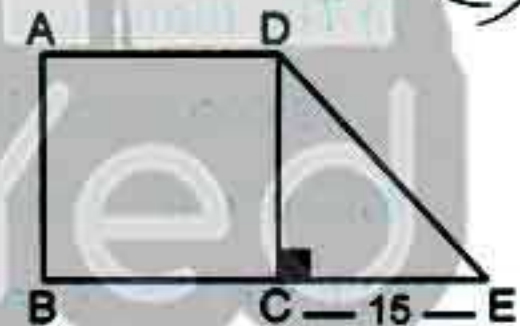
2 Complete each of the following:

5

- a) If  $X = \{x : x \in \mathbb{N}, x < 5\}$ , then  $X = \dots\dots\dots$
- b) A rhombus the lengths of its diagonals are 6 cm and 10 cm, then its area = .....  $\text{cm}^2$
- c) If  $75 = 5 + 10 \times x$ , then  $x = \dots\dots\dots$
- d)  $(85 + 62) - (62 + 85) = \dots\dots\dots$

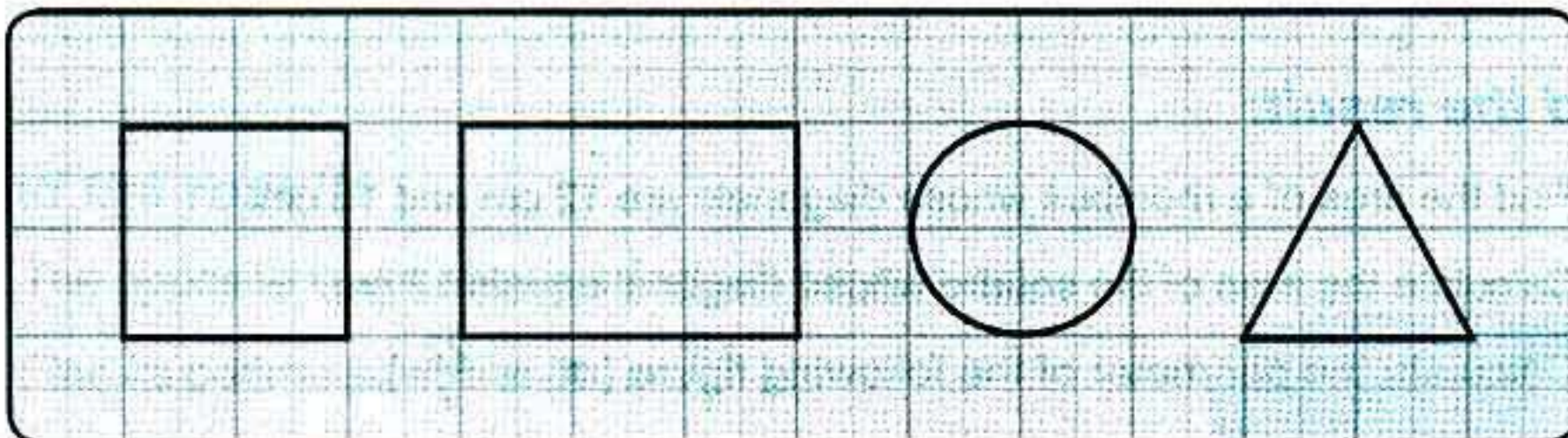
3 In the following figure: ABCD is a square,  $E \in \overrightarrow{BC}$  such that  $CE = 15$  cm, and the area of  $\Delta DCE = 150 \text{ cm}^2$ . Find:  
The area of the square ABCD.

5



4 a) Draw the line of symmetry for each of the following figures:

5

b) If  $a = 3$ ,  $b = 4$ , calculate the value of:

- 1)  $2 \times a + 5 \times b$       2)  $(b + a) \times (b - a)$

24

GEM / MATH / Primary 5